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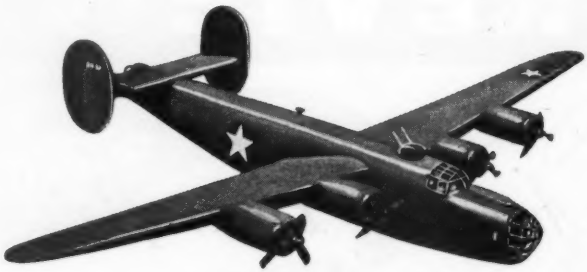

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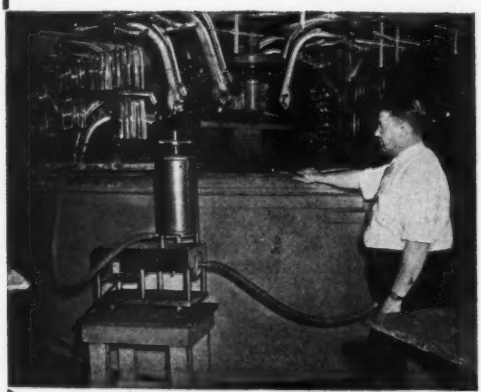

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THE COVER

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CONTENTS

Hiller — A Discussion of Methods for Control and Analysis of Electrodeposited Coatings Used on Aircraft Parts..... 786
Hirdler — Chemical Surface Treatments for Steel..... 798
Calabrese — Brass Plating 810
Newell — Protection of Steel by Coatings of Zinc and Cadmium 818
Caldwell — Educational Programs 824

DEPARTMENTS

New Products 828
Industry News 840
Branch News 848
Abstract Section 854
Book Department 856
Membership Report 859
Buyers Guide 865-872
Branch Directory 873
Advertisers Index 875-876

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A Discussion of Methods for Control and Analysis of Electrodeposited Coatings Used on Aircraft Parts

By ROBERT HILLER
Chief Chemist Triplett & Barton, Inc., Burbank, Calif.

PLATING, like any other chemical process, has certain variables. In order to keep these variables within correct limits for good deposits and economical operation, constant chemical control is of definite value. For most instances, good plating can be obtained by relatively simple control. In order to know the trend of plating solutions, the results of accurate analyses made at stated intervals can be plotted to show the growth of any undesirable solution impurities or characteristics. The type of solution analysis depends on the solution itself* and the constituents and characteristics that are to be determined.

This condition regarding solution analyses applies to all types of plating. In plating aircraft parts, however, the use of other controls to analize the quality of the finish is often involved. Hence, not only are plating and anodizing solutions carefully controlled but the films which are produced in them are also checked. The variables which appear to be most important in connection with these films are—thickness, permeability, adherence, hardness and performance. Let us consider them in this order.

THICKNESS

Plated coatings involve quite thin deposits. Usually they are between 0.0001 and 0.0005 inches. Electroformed or "built-up" deposits are of course, exceptions. Therefore, ordinary methods of gauging cannot be used and several special instruments and techniques have been devised. Some of the types of measurement are—stripping, special gauges, conductance, microscopic examination and possibly X-ray analysis.

Stripping tests are based upon the removal of the plate by immersion or exposure to a calibrated solution under certain stated conditions and noting the development of signs of decomposition within a given amount of time or determining the weight of the deposit removed from a given area and then calculating the thickness.

*Presented at October 1942 Meeting of Los Angeles Branch A.E.S.

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Some types of stripping tests use jet or drop apparatus. In these a stream of suitable reagent from a small jet or regulated series of drops are allowed to strike a section of the plated surface which is placed at a definite distance and angle (45°) from the source of reagent. The time required to remove or perforate the plate is a measure of thickness. This type of method is especially useful for measuring cadmium plate on steel parts.

Two special mechanical measurement methods are the Spherometer and Mesle's Chord. The Spheremeter or "modified radius gage" is a three legged stand with an adjustable microscrew passing through the frame. The vertical movement of this screw is shown on a dial in a manner similar to the operation of a watch gauge as a "feeler" on precise machine work. Thickness is determined by subtracting the width of the stripped piece from its original dimension

The method originally developed by F. C. Mesle, for use on silver plated teaspoons can also be applied to other deposits and is known of course, as Mesle's Chord Method. As the attached illustration show, thickness is calculated by the formula (Thickness) — $T = \frac{C^2}{8R}$ is the square of the chord or width of cut; and 8R eight times the radius of the grinding wheel or curved surface.

The value of C is secured by accurately filing or grinding one section of the plate just down to the base metal which is naturally indicated by the appearance of a different metal area. The length of the cut can readily be measured with the use of a magnifying glass and steel scale. If necessary, the undercoat or base metal can be appropriately etched to contrast with the coating. Its portion of the cut or chord can then be measured and subtracted from the original measurement. A neutral saturated solution of copper sulfate for ferrous parts and mild chromic sulfuric acid solution for copper alloys are suggested for this purpose.

Then, by finding the radius (R) of the curved surface or grinding wheel, two of the three unknown values can be obtained and the equation for thickness completed. Research at the Bureau of Standards, showed that an accuracy of approximately 10% of the true thickness value could be obtained on coatings of more than 0.0002″ thickness.

The third method for determining thickness — Conductance — or by electrometric means, has been utilized in the so called "Flashlight" Test for anodic aluminum coatings. The Magna Gage and similar instruments,

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employ magnetic circuits which have previously been calibrated against magnetic or non-magnetic coatings of known thickness. The magnetic attraction of the magnetic undercoating or base metal is indicated by the amount of adjustment required to balance the circuit. This amount in turn is converted into terms of actual thickness by comparison with the previously charted calibration curve for that particular gauge's permanent magnet.

The "Flashlight" Test is a simple illustration of Conductivity. It employs the fact that the anodic coating is considered to be a non-conducting film of hydrated aluminum oxide which varies from 0.00003 to 0.00008° or more. Hence, when an ordinary flash light bulb is placed in series with the aluminum part under test and a source of current (flashlight battery), the light will go on only if the coating is not sufficiently thick and hence conductive or unsatisfactory.

(Of course, the problems in evaluating anodic films on aluminum are more related to wear or service and paint adhesion tests such as is indicated by the well known "Salt Spray Test" or paint adherence as shown by bending a painted test piece over a tapered mandrel than to actual thickness.)

The fourth method of determining thickness — microscopic examination of a polished section is one with which you may be familiar. It offers both a high degree of accuracy when properly used and an insight into the actual character of the electrodeposit. Unfortunately, the following disadvantages should also be considered. In numerical order they are as follows:

1. Initial cost of a suitable microscope and the proper grinding set-up for preparing the specimen that must accompany it.

2. Difficulty of correctly polishing and often etching the specimen.

3. The relatively small area which can be examined at one time because of the degree of magnification which means that only an approximate value is obtained.

4. A certain amount of skill and experience is required not only to properly prepare the specimen and adjust the microscope but also to evaluate the results obtained.

Lastly, X-Ray measurements have been considered as a means for non-destructive measurements. Three methods which might be used are "Cloud Chamber", Radiographs and Diffraction Patterns. In the "Cloud Chamber" method the absorbtion of X-Ray passing thru test piece would be measured with gas ionization chamber. A comparative set of meas-

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urements made with an electrometer would indicate the amount of charge adsorbed and hence the plate thickness could be determined by comparison with the adsorbtion values obtained from working with plates of a known thickness.

The radiographic method as proposed by Woods is based upon measureable differences in the density of radiographs made of plated parts. Such differences could be noted by the used of a Densitometer and plotted against actual thickness values or controls.

Measurement of the density of the X-Ray Diffraction Pattern of an electrodeposit was suggested by H. R. Isenberger at the 1939 Convention of the American Electroplaters' Society. It is also possible that X-Ray Diffraction Patterns might give definite information regarding the structure of a deposit. However, the field of X-Ray examination of electrodeposits offers great possibilities and requires further exploration. The mere fact that X-Ray tests are non-destructive and can be adapted to mass-production methods of inspection makes them potentially very useful.

PERMEABILITY

Permeability and porosity or "tightness" of a deposit are qualities that can sometimes be appraised by microscopic examination of a polished surface. For non-destructive examination however, certain procedures have been developed which depend upon the base metal or undercoat reacting with a suitable indicator if they are not adequately covered.

In these methods a suitable solution is applied to the surface in question either directly or by means of moistened filter papers. A color change caused by the reaction between base metal or undercoat and the indicator will occur at the point of porosity. For instance, chrome or nickel plated iron or steel parts can be treated with a 1% salt solution containing 1 gram per liter of sodium or potassium ferricyanide and 1% Agar. Exposed iron is shown by a blue coloration. With this same solution if a copper undercoat or copper alloy base is exposed, red spots will develop. Likewise an ammoniacal solution of dimethyl glyoxime should turn a scarlet color if a nickel undercoat is exposed.

ADHERENCE

The adherence of plated coatings is sometimes determined by bending a plated sheet over a tapering radius such as a mandrel. Signs of non-adherence are splitting or cracking. Much work has also been done using methods which would give a more quantitative expression of adhesion

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such as those developed by Jacquet and by Ollard (modified by Roehl). These are somewhat complicated and involve the use of suitable tensile strength machines in order to apply measureable forces to detach a plated coating from the basis metal.

The problem of determining the adhesion of plated coatings in such a manner that satisfactory ones are not destroyed is one that warrants a solution. It is made difficult by the fact that much physical force is involved. For instance a force of 85,000 lb./sq. in. in tension is required to separate a good deposit of "hard nickel" from steel. It may be that a relatively simple method utilizing the pressure of hydrogen occluded by cathodic electrolysis of the test piece could be devised. Two Frenchmen are reported to have used this approach but their results are not well known.

HARDNESS

Ordinary methods of hardness testing such as those based on penetration are misleading unless the plate is thick enough to have independent penetration resistance qualities. Such a condition usually exists only in the case of electroformed parts. British researchers however have published certain ranges of Brinnell hardness which might at least be used for a rough evaluation. For most hardness measurements there is also a scratch test based upon the use of a pyramidal shaped diamond cutting tool — the width of whose cut indicates the degree of hardness. Unfortunately the results are hard to duplicate very accurately and the required coating thickness must be 14 times the depth of the impression. (Brinnell measurements require the factor of 7.) However scratch hardness method requires only very slight impression.

Since the hardness of plated coatings is associated with the crystalline form of deposit, the use of X-Ray diffraction patterns might be investigated for this purpose. Wear, or more properly — abrasion — tests based upon the ultimate breakdown of the surface under an abrasive force after a given period of time as well as Hardness tests based upon resistance to deformation should also be considered in discussing Hardness; because after all, the purpose of determining Hardness is to predict the value of a plate under certain conditions. In many instances the hardness secured through plating a surface is closely correlated to wear resistance. A good illustration is "Hard-Chrome" plated pistons. For this (wear) type of measurement, some modification of an abrasion meter, such as the Tabor Abrasimeter might be tried.

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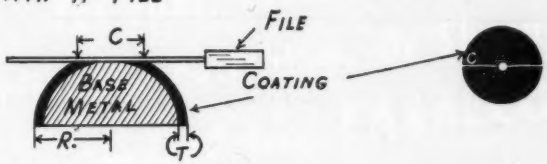
In closing this discussion it might be said that the true value of a plated coating cannot be determined by any one test. The closest approach is derived from studying the behaviour of a plated coating "on the job". It should also be remembered that some of the methods discussed are for research work, but many are standard procedures and the trouble and expense of using them has been and will continue to be justified because they give a satisfactory evaluation of the coating in question.

REFERENCES

1. Plating and Finishing Guidebook (1941 Ed.) pp. 100 ff. Metal Industry Publishing Co. 116 John St. New York, N. Y.
2. Hedges, Protective Films on Metals, pp. 243 ff. Van Nostrand Co. New York, N. Y. (1937)
3. Reilly & Ray, Physico Chemical Methods, pp. 167 Van Nostrand Co. (1932)
4. F. C. Mesle – Metal Industry Vol. 33 (1935) pp. 283 ff.
5. Blum & Brenner – Monthly Review A.E.S. Vol. 23 (1936) pp. 14 ff.
6. National Bureau of Standards Research Paper 866 (Feb. 1936)
7. R. R. Janssen – Monthly Review A.E.S. Vol. 29 (1942) pp. 675 ff.
8. American Instrument Co. Bulletin MF-2070 (c/o Silver Spring, Maryland)
9. C. E. Heussner – Proceedings A.E.S. (1942) pp. 75 ff.
10. H. R. Gardner, Technical Methods for the Analysis of Paints, Pigments and Related Materials, Ch. on Adhesion (9th Ed.) Wash., D. C.
11. R. C. Woods – Metal Finishing Vol. 39 (1941) pp. 365 ff.
12. Blum & Hogaboom, Principles of Electroplating & Electroforming, pp. 129 ff. McGraw Hill Book Co. New York (1930)
13. The Electrochemical Society – Modern Electroplating (c/o Office of its Secretary, 3000 Broadway, New York)
14. A. Portevin & M. Cymboliste – Rev. Met. Vol. 30 (1933) p. 323
15. Hedges (Ref. 2) pp. 286

FIG. 1

TESTING A COATING ON A SPHERICAL SURFACE (DOME) WITH A FILE

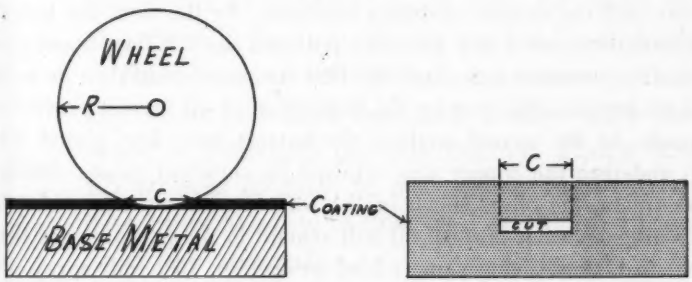


CROSS SECTION TOP VIEW

FORMULA $T = \frac{C^2}{8R}$

FIG. 2

TESTING A COATING ON A PLANE SURFACE WITH A GRINDING WHEEL



CROSS SECTION TOP VIEW (WHEEL REMOVED)

FORMULA $T = \frac{C^2}{8R}$

TAKEN FROM PAGE 15 MONTHLY REVIEW A.E.S. APRIL '36

Chemical Surface Treatments for Steel

By F. CARL HIRDLER, Jr.

Process Engineer, Turco Products, Inc., Los Angeles, Calif.

VARIOUS types of coatings have found wide acceptance during past years for the rustproofing or ornamentation of iron and steel. Many new fields are continually being opened to them where they may be applied with great success.

Probably the earliest method of blackening steel was heat-blackening. Of course this may not be done where the temper of the metal is involved.

In general, inorganic chemical surface treatments may be classified as oxide or phosphate types. Electroplating will not be included as a chemical treatment due to its electrical nature. Organic paint-type coatings will be discussed as secondary, rather than primary coatings.

It has long been known that steel may be blackened by chemical means. Several methods are in commercial practice today. Quite a few patents have been granted on this subject.

Early gun blueing practices included both the browning or rusting treatment, and the copper oxidation treatment. In the first, the barrels were alternately rusted and partially polished until a fine, dense iron oxide surface structure was obtained. This structure could then be made somewhat corrosion-resistant by the absorption of oil or rust preventive compounds. In the second method, the barrels were first plated with copper, and then the copper was oxidized by chemical means. Neither of these treatments offers much in the way of rust resistance. As the coatings are somewhat porous, oil will remain in the pores longer than on bare steel, thus giving some added protection. In a salt spray, the bare, dry coatings are little better than bare, dry steel. So we might say that the major value of these coatings is ornamental rather than protective. These two types of coatings have been largely supplanted by the oxide types.

The oxide method of surface treatment for steel consists of boiling the steel in a solution composed of water, sodium hydroxide, and various other chemicals, such as sodium nitrate, sodium nitrite, sodium chromate, etc. These other chemicals vary according to the exact proprietary compound being used. Most of the mixtures which will give pleasing results are patented and are put out under proprietary names. After the above

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treatment the parts are rinsed in water and oiled, usually with a soluble type oil. Due to the fact that large amounts of chemicals are dissolved in water to make up the solution, the boiling point is quite high, often as much as 400° F.

Operation of the tanks is fairly simple. Inexperienced operators may handle the whole procedure in most cases.

The average setup will consist of a cleaning tank, rinse tank, hot solution tank, rinse tank, and oil tank. If badly rusted steel is to be processed, a pickle tank and a rinse should be provided. Certain of the proprietary processes recommend two processing tanks, to be used at different concentrations and temperatures. These are merely variations of the basic process.

There are several advantages to this process. Cleaning of parts prior to processing is not too critical, as the solution itself is a good cleaner. Also, complete rinsing after processing is not mandatory as the film remaining on surfaces inhibits corrosion on steel. However, it is to be pointed out that this solution is hard on hands and clothes, and parts should be completely rinsed so as to preclude possibility of harmful effects on materials with which they may come in contact in the future.

The film formed by this process is an iron oxide. It penetrates the metal surface only a few hundred-thousandths of an inch, and causes no dimensional build-up on parts, Thus no difficulties would be encountered with the use of this finish on threads and finely machined surfaces.

The shiny blue-black film is also desirable from an ornamental standpoint. A high luster may be obtained if parts are polished prior to processing. A sandblasted surface will give a dull, black coating.

Certain manufacturers of proprietary compounds for the oxide process advertise that the oiled coatings obtained by their process have good lubricating, or friction reducing properties. They also claim greater abrasion resistance on processed parts.

The main disadvantage of the oxide process lies in the poor corrosion resistance of the finished parts. When tested in a standard salt spray conforming to the Specification AN-QQ-S-91, bare panels last only two to five hours. Even oiled panels ordinarily show signs of rusting in less than 20 hours. Obviously, structural parts for aircraft processed in this manner could not be expected to stand up under severe service conditions.

As an ornamental finish the oxide process is suitable provided that proper precautions are taken in preparing surfaces for treatment. All surface imperfections, machining marks, and scratches, will not only

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When you buy equipment for plating, buy with an eye on quick conversion to peacetime decorative plating with nickel, chrome, copper, brass, etc. Meaker equipment can be changed over to the peacetime job in a jiffy. Fact, many of our customers right now are getting new equipment to hustle that war job, and bustle that peace job, too, as soon as we have finished the Axis.

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show in the finish, but will seemingly be magnified. Parts must be polished or buffed prior to processing if prefect surface finish is expected.

For the duration of the war, while Inconel and stainless steels are difficult if not impossible to obtain, the protection of the low-alloy substituted steels is an important problem.

It is true that these low-alloy steels may be cadmium or zinc plated. However, cadmium will no longer be allowed for plating purposes in a few months, except in special cases. Zinc is so extremely anodic to steel that in many instances it proves a poor protection, as it is so rapidly corroded. Chromium, nickel, and copper, not only are cathodic to steel, but are even more critical at present than cadmium and zinc.

These facts can be verified by reference to Tables 1 and 2. It is to be noted that materials close together (having practically the same potential) are not very reactive to one another, whereas those separated by a great distance in the table would be extremely reactive.

As a result of this situation the phosphate, or second general type of chemical surface treatment for steel, is becoming more popular daily.

Phosphate-type coatings for steel have been known since 1869, the date of issuance of the first patent on this subject. Since that time, over one hundred patents have been issued, covering various phases of this work.

It is now possible, by varying certain factors such as cleaning, surface finish, type and concentration of solution, temperature, time of immersion, and after-treatment, to obtain phosphate coatings of varying thickness, porosity, and corrosion resistance.

Due to the many different types and usages of low-alloyed steels, it is only fitting that protective coatings be developed to suit the various needs of industry. And we find that this is the present situation.

The primary type of solution for applying these coatings to steel is composed mainly of the orthophosphates of iron and manganese, or of the orthophosphates of iron and zinc. Often these solutions incorporate free phosphoric acid. In some instances fluosilicic acid, or a soluble fluosilicate is added to impart additional corrosion resistance to the coating.

Steel parts immersed in such a solution will receive a coating composed mainly of interlocking crystals of secondary and tertiary iron and manganese, or iron and zinc, phosphates. The exact chemistry of these reactions is not too well known, as several authorities on this subject are not in complete agreement. Various solutions are on the market today, under proprietary names, which are satisfactory for producing corrosion-

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★

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resistant coatings on steel. It is to be understood that all the more advanced types are covered by recent patents.

In order to produce a reasonably satisfactory coating in a short period of time, modifications of the above described solutions have been developed which contain accelerators. Literature refers to both metallic copper and to nitrates for this purpose, but the weighted opinion seems to favor nitrates. By using proper proportions of accelerator and spraying the hot solution on the steel, it has been found that satisfactory coatings can, in certain instances, be obtained in from one to two minutes, instead of the thirty to sixty minutes required by the standard processes.

It is mandatory that parts being processed be free from dirt, grease, rust, and scale if best results are expected. The solution in itself will act as a rust remover, but in so doing it will deposit a coating of inferior corrosion resistance. Should parts be rusty or scaled, it is suggested that they be pickled in sulphuric or muriatic acid and thoroughly rinsed prior to phosphate treatment.

After treatment, parts should be given a thorough rinse in hot water to remove solution and products of reaction.

Due to the fact that it is almost impossible to completely rinse solutions from parts, even with running fresh water, it is recommended that parts be given a passivating treatment by dipping them, for about one minute, into a .5-1.0% solution of chromic acid at a temperature of around 180-200° F., especially in the case of parts given the short-time treatment. This chromic acid materially increases corrosion resistance and neutralizes any active agents which were not removed by the hot water rinse. In addition, the heat will assist in the drying of the parts.

Steel so processed will usually have a grey surface, and will probably show brown or tan-colored streaks. These streaks are chromic acid stains and do no harm. In fact, they usually add to the corrosion resistance and subsequent paint adhesion. This may be exemplified by the chromic acid dip, required by Army and Navy specifications, on parts after cadmium and zinc plating. This chromic acid dip neutralizes the cyanide and caustic on the parts, brightens them to some extent, and adds materially to the corrosion resistance and subsequent paint adhesion. Even though a few hundred-thousandths of an inch of plating (or phosphate coating) are removed by the chromic acid, intensive investigation has shown that corrosion resistance is still greater than on untreated parts, and considerably greater than on parts given a nitric or sulphuric acid bright dip. It is common knowledge that alkalinity on the surface of any material

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Around the world — on every front — steel products of war are finished with Pentrate. Many types of weapons, steel propeller blades, engine parts, precision instruments and a multitude of other items have this protective Pentrating finish.

Designers and engineers with an eye to post war products have included Pentrate in the plans for the future.

Pentrate gives a deep black durable rust resistant finish to steel. There is an actual penetration with positively no size change. Bearing manufacturers have found the friction reducing quality of Pentrated surfaces advantageous.

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*PATENTED

greatly reduces the paint adhesion. In addition, unpainted parts contaminated with alkaline products on the surface may easily be the cause of corrosion to adjacent aluminum parts at a later date. For these reasons it is necessary that the chromic acid dip be the last operation, and that the chromic acid rinse be used for no other purpose.

After drying parts may be dyed black with hot water soluble dye. This will not add appreciably to the corrosion resistance.

The new U. S. Army Specification 57-0-2B gives a table listing standard salt spray requirements to be met by the various finishes. The applicable salt spray specification is AN-QQ-S-91. Zinc-plated parts must not show failure after 48 hours in the spray. Dry phosphate coatings must withstand three hours, and oiled coatings, twenty-four hours. Dry oxide type finishes must withstand ½ hour, and oiled coatings, two hours. Ordinarily cadmium-plated parts are required to withstand 250 hours.

It can readily be seen that this new specification will not give a true picture of the corrosion resistance of the various coatings, as there are on the market today rust preventive oils which will withstand 500 to 1500 hours in the salt spray on bare steel.

According to test results from at least one major aircraft company, properly applied and passivated dry phosphate coatings will withstand approximately 100 hours in the salt spray against two to six for dry oxide type coatings.

A local paint company, working in conjunction with a process engineer from one of the aircraft companies, has recently developed a drying type oil finish to be applied over phosphate coatings. It is readily adsorbed into the pores of the coating and gives an abrasion resistant finish. Regular primer and lacquer coatings may then be applied over this finish. Without additional paint coatings test panels have withstood nearly 1000 hours in the salt spray. If coats of primer and lacquer are added, over 2000 hours could be expected.

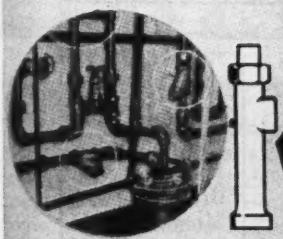
One serious drawback of cadmium plated parts is the fact that threads give galling and flaking troubles. Government aircraft specifications do not allow undercutting of threads to be plated. This difficulty is overcome in the use of phosphate coatings, which do not flake or gall.

Phosphate coatings will usually average around .0002-.0005 inch per side, depending upon the type of cleaning used. Tests show that vapor degreasing and alkaline cleaning give two different thicknesses of deposit.

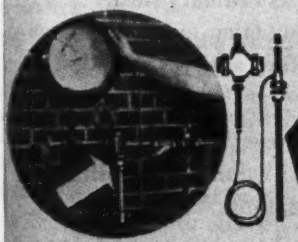
Due to their nonmetallic nature, these coatings are fairly poor conductors of electricity. Accordingly, spot welding would not be practical

Simple

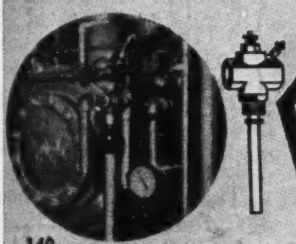
Temperature Controls for Industry



At the cost of a good steam trap, the Sarco No. 87 Thermoton takes care of condensation removal and at the same time provides approximate temperature control of steam heated tanks, kettles or other small equipment. Catalog No. 550.



Sarco type TR-21 self-operated temperature regulators are standard equipment on water and oil heaters, for all types of process work. Valves are packless — no stuffing boxes to leak or stick. Catalog No. 600.



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148

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and special precautions should be taken when electrical bonding (i.e. grounding) of parts is desired.

Although time does not allow a deep discussion of this problem, it can be seen that the platers have a new finish at their disposal should priorities eliminate cadmium and zinc plating.

(Delivered to The American Electroplaters Society, Los Angeles Branch, at their Regular Monthly Meeting, held March 1, 1943.)

TABLE I

Anodic							Cathodic
			2S				
Mg	52S	4S	3S	A17ST	17S	Steel Chrome Plate	
			53S	Cad.	24S	18-8 Stain	
Zn			Alclad	X-4130		Brass Monel	

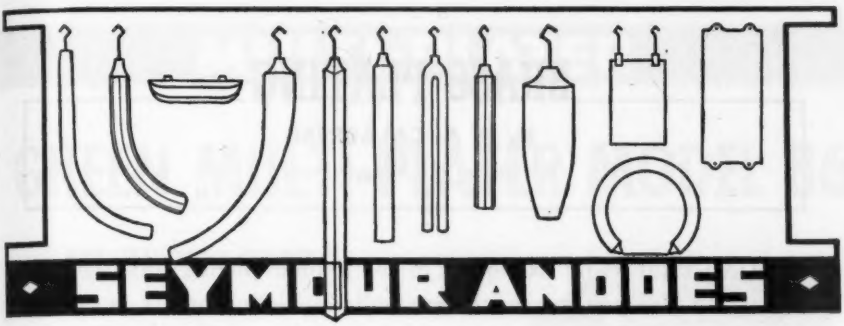
X-4130 may be variable and may at times act as ordinary steel.

Any material will be anodic in contact with any other materials shown in a column to the *right in* Table I, and will afford anodic protection to such materials.

TABLE II

Negative potentials (in volts) as measured by a calomel half-cell using a normal NaCl plus 3% Hydrogen Peroxide solution.

Magnesium Alloys	Magnesium ..	1.73	Aluminum Alloys	Cadmium	.82
	AM3S	1.71		365-T4	.81
	AM57S	1.68		355-T4	.78
	AM240-T4 ...	1.66		A-17ST	.73
	Zinc	1.00		195-T4	.70
Aluminum Alloys	220-T4	.96		17ST	.68
	72S0	.96		24ST	.68
	214	.87		Mild Steel	.67
	56S0	.87		Lead	.55
	Pure A1 (7A)	.85		Tin	.49
	52S0	.85		Chrome Plate..	.35
	2S0	.83		60-40 Brass....	.28
	2SH	.83		Copper	.20
	3S0	.83		18-8 Stainless..	.15
	3SH	.83		Monel	.10
	53SW	.83		Silver	.08
	53ST	.83		Nickel	.07
	61ST	.83		Inconel	.04
	43	.83			



NICKEL

99% + Rolled Depolarized — A very fine, homogeneious, even-grained virtually pure nickel anode. Corrodes in hot or cold solutions with minimum metallic loss. Forms practically no sludge. Especially suitable for baths having a pH above 4.5 electrometric.

99% + Cast Oxide Depolarized – Almost entirely pure nickel. Suitable for most cold nickel baths, but especially those having a high pH. Corrodes evenly under most ordinary shop conditions.

99% + Cast Carbon – A pure nickel anode with carbon content adjusted for smooth-uniform corrosion without special controls. Available, however, with carbon content to meet any specifications. Adaptable for general run of shop work requiring cold baths.

95-97% Sand Cast – Corrodes readily in solutions low in nickel or weak in salts – therefore suitable for cold, high pH, low current density plating solutions. Uniform corrosion throughout the life of this anode is obtained by an even distribution of the carbon content. A 90-92% Sand Cast Seymour Nickel Anode is also available.

"Seycast" – An improved type of 99% + cast anode of very high efficiency designed primarily for Bright Nickel baths, but works perfectly in any hot Watts bath having a pH of 4.5 electrometric or lower. Corrodes evenly with practically no loose nickel formation, due to long, interlocking grains radiating from a common center. Especially suitable for high current densities.

Bright Nickel – A hot organic type process free from promoter metal, stable and easily controlled. Produces brilliant deposits from a standard hot nickel bath without the usual coloring or buffing. Excellent throwing power. Wide operating conditions. Free from wetting out agents.

OTHER ANODES

Seymour Anodes in all shapes to meet rigid specifications are also available in copper, brass, bronze and zinc. The copper used is electrolytic. The zinc is always the best grade obtainable.

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BRASS PLATING

By D. A. CALABRESE

Member of the Newark Branch

TONIGHT I would like to talk to you in plain plating language, and try to give you my experience in Brass Plating over a period of years. I would like to take you back to a hot summer day when Thomas Haddow led me up the stairs and into a steaming room. Little did I realize that my life's work was to begin.

I spent 3 years with Tom, and it was he who set the foundation and made me realize that plating was a trade and an art that the average layman did not appreciate. I spent another 3 years in various plating plants in the city, where brass plating was the main finish; and it is amusing now to have seen some of the pet hobbies that some platers had in running a brass solution. Brass solution was a very much feared bath; under no conditions would they use Copper Cyanide in making up or maintaining this bath. The Copper Carbonate was mostly used. Some went as far as making up their own copper carbonate by dissolving copper sulphate in H_2O and perapitale with sodium carbonate.

Along about 1921 I met up with that lovable character Oliver Sizelove. Oliver had charge of the finishing department at the Elite Novelty Co. Some of you may remember that firm and it was really here that my knowledge of brass plating began. This firm specialized in church work and jewel boxes. These objects were made of lead casting, with 6% Antimony. Work was first wet scratched brushed and put into a cyanide copper for 5 minutes.

Copper Cyanide — 3½ oz. per gal.

Sodium Cyanide — 4 oz. per gal.

Free cyanide in this bath was kept very low to prevent blisting, work was then put into an acid copper solution for 1½ hours and dipped in

MULTI-PLATER

GREEN MULTI-PLATER MODEL 86

ALL IN ONE CABINET —

the MULTI-PLATER provides eight (8) separate selenium rectifier sections each having an output capacity of 6 volts 500 amperes.

For quick, simple installation and mobility, MULTI-PLATERS are mounted on casters.

Separate output terminals make it possible to connect each rectifier section to a separate tank, or several sections may be added together for higher voltage or greater current capacity, or *all* the sections may be grouped together in a single bank.

When sections are used individually, or in groups, there are *several hundred* possible combinations; for example: If all eight sections are interconnected any one of the following outputs may be obtained:

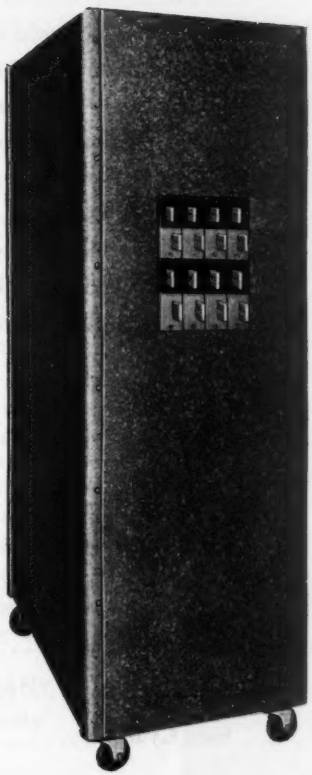
6 volts 4000 amperes,
or 12 volts 2000 amperes,
or 24 volts 1000 amperes,
or 48 volts 500 amperes.

Standard MULTI-PLATERS provide internal connections for operation from 220, or 440 volt 60 cycle 3 phase supply.

MULTI-PLATERS can be furnished for other supply voltages.

MULTI-PLATERS of lesser capacity than Model 86, as illustrated, are also available.

Write Dept. R for illustrated booklet.



42" wide, 24" deep, approx. 81" high.

W. GREEN ELECTRIC CO., INC.

ESTABLISHED 1892

Builders of SELECTRO PLATERS and all types of rectifier equipments.

Green Exchange Bldg., 130 Cedar St., New York

a regular bright dip solution and brass plated for 5 min. in the following solution:

Copper cyanide..... 3 oz.
Zinc cyanide..... 1 oz.
Sodium cyanide..... 5 oz.

This solution produced a greenish tint which took on a beautiful gold plate in a salt water gold solution. The finish of these products depended on the brass plate in maintaining a uniform color from day to day, and I recall the many Saturday afternoons and Sunday mornings I spent at Mr. Sizelove's home trying to find ways and means of controlling this solution by chemical analysis.

The year of 1924 gave me the thrill that all plater helpers look forward to – that of facing his own problems and making his own way in the plating field. What a problem I had in my first job as foreman plater. These brass solutions were facing me at this job and my notebook gave me the following analysis of these solutions:

I

Copper Content	6 oz. per gal.	88% Cu.
Zinc	8 oz. "	12% Zinc
Free Cyanide	4 oz. "	

II

Copper Cyanide	4 oz. per gal.	67% Cu.
Zinc Cyanide	2 oz. "	33% Zinc
Free Cyanide	6 oz. "	

III

Copper	4.8 oz. per gal.	83% Cu.
Zinc	1 oz.	17% Zinc
Free Cyanide	6 oz.	

You can readily see what a brass deposit you could expect from these solutions.

Have you a Tough metal cleaning problem?

These engineers can help you quickly — at no cost or obligation

If you want to cut your degreasing costs and speed up your metal-cleaning work — if you have a difficult metal-cleaning job that's giving you trouble — get in touch with us *at once!* There is a lot more to solving a degreasing problem than just buying some new degreasing equipment. Our engineers travel from coast to coast working on every possible type of metal-cleaning operation. They have licked some problems that were called impossible. They are *specialists in degreasing* with many years of experience in that field. They will tackle any job — without a penny of cost or obligation to you — *and we mean just that!* Write *today* telling us what your problem is — and you will get quick action!

PHILLIPS MANUFACTURING COMPANY
3448 W. Touhy Ave., Chicago, Illinois

Phillips MANUFACTURING COMPANY

My teaching and daily contact for 4 years with Mr. Sizelove and my knowledge to analyze these solutions won my battle.

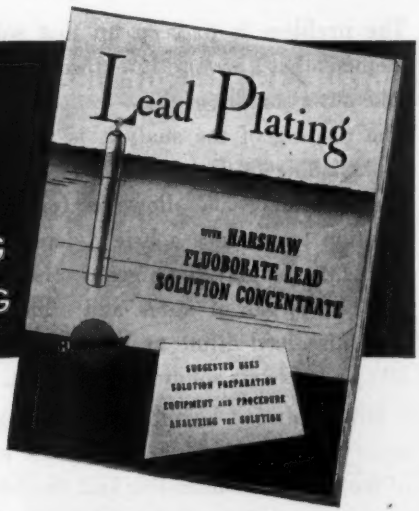
Today there is no reason for any plater not being able to control his solutions, if he will take time to do it. Methods have been worked out and published for you in plain talk. The analysis of copper and cyanide content is a very simple method for analysis. The difficulties that I have experienced at the beginning is the determination of the Zinc content, that I would like to talk briefly about and give you the methods of analysis, that I have followed. Take 5 cc of brass solution, dilute with 50 cc of H_2O, and heat to 140° F. Add while stirring a saturated solution of sodium sulphide. The zinc will be percipitate, the copper will be left in solution. Filter zinc sulphide percipitate, and wash thoroughly to remove traces of Cu., transfer ppt. and the filtered paper to 250 cc beaker. Add 10 cc of concentrated HC and a few crystals of sodium sulphite boiled to expel H_2S gas. Dilute to 150 cc with water and heat to 140° F. Add 1 cc of uranium nitrate. Solution is now ready to be titrated with a solution of Potassium Ferro-cyanide using uranium nitrate an outside indicator. Great care should be exercised in watching your end-point at this stage. End-point is a faint brown color. It is advisable to make analysis of the zinc content, at least twice, using your first analysis of your zinc as a guide and to watch that you do not go over your end-point.

I stress this point, for I believe the zinc content in a brass solution is a very important factor in controlling your bath. There is one subject that we have lost sight of and I would like to talk about it and that is the percentage of metals in our compound salts. A little chemistry is needed here and I am sure most of you had that. Chemical formulas and the weights of the elements must be known. For example I will give you the two metals that go to make up a brass solution, copper cyanide — (Cu. CN). The weight of Cu. Cn. is 89.6. The weight of Cu. is 63.6 ÷ 89.6 = 71% of Cu, content in copper cyanide. Zinc cyanide $Zn(CN)_2$ the weight of the compound is 117. The weight of the zinc is 65.

$$65 \div 117 = 56\%$$

Percentage of metals in the salt are very important to remember. Making up a brass solution from a given formula is a very simple matter.

IF YOU ARE *NOW*
LEAD PLATING
OR
IF YOU ARE *PLANNING*
TO DO LEAD PLATING



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The booklet is written for platers. It is designed to answer their questions about lead plating with Harshaw Fluoborate Lead Concentrate. We believe it contains that kind of helpful information you want—and can use—whether you are lead plating *now;* or whether you are *planning* to do lead plating.

SOME OF THE SUBJECTS THIS BOOKLET COVERS:

- Applications for lead plating
- Preparation of the solution
- Bath concentrations and rate of deposition
- Thickness of deposits
- Tanks
- Current densities and voltages
- Temperature
- Determining pH
- Anodes
- Agitation
- Operating notes
- Solution control

Send for your free copy of this booklet . . . now while you are thinking about it. Address a post card or letter to

THE HARSHAW CHEMICAL CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

The problem is to keep up that solution in proper proportion. The methods that I have followed was to watch my color of my brass deposit, take out a sample of this solution, check it, and keep this as a standard. The reading of the analysis is always in metallic oz. per gal. and in replenishing to the proper ratio, remember the percentage of metals in your salt and make allowance for it. When arsenic is added to a brass solution to produce a bright deposit care should be used to avoid an excess, to prepare the arsenic solution, take 2 lbs. of caustic soda, dissolve in ½ gal. of water, add 1 lb. of white arsenic and when all have been dissolved dilute to 1 gal. One oz. of this stock solution to every 100 gal. of brass solution is sufficient.

Brass solution being an alloy solution may be expected to introduce some difficulties, such being the case why complicate matters by addition of the so-called conducting salt, that are commonly used. I can truthfully say in all my brass solutions I have never used anything, but the two metals and the free cyanide that is required and occasionally a little Ammonium Hydroxide. The free cyanide, the temperature and current density are important factors in maintaining a good clean brass deposit.

When a brass solution contains too great an excess of free sodium cyanide an evolution of gas takes place on the objects being plated but the deposit is formed slowly or not at all; besides the deposit formed has a tendency to peel off in scratch brushing. The free cyanide content in a flash plate should be kept very low, ½ oz. per gal. is sufficient. It is possible to operate a brass solution at room temperature, but a more uniform and clear color will be obtained if the temperature is maintained at so me point near 100° F. It is absolutely essential if a uniform color is desired in the operation of a brass solution to hold all conditions within reasonable limits from day to day.

We are all aware of the shortage of metals. Therefore, it is the duty of every plater to make use of the knowledge that he possesses. Check your solution weekly, doing this you eliminate guess work. Do not try to perform tricks with your brass solution.

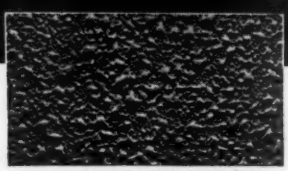
From what we hear and read about the plating industry is in a tough spot. Pessimism and fault finding will not win it. We must go forward with confidence and courage and have faith in the principles of freedom and fair dealing that prevail in this great country of ours.

New EGYPTIAN Rough Finish for Metal Surfaces

FACTS ABOUT PEBBLE-TEX

Photo U. S. Army Signal Corps

Formulated to provide a protection to such important war products as radio sets, searchlights, instrument panels, fire control and listening devices requiring a rough finish that will stand exposure and harsh treatment, PEBBLE-TEX is also wanted by manufacturers of essential civilian articles. Note these outstanding advantages: **1. Air-drying at 20 minutes. Saves time, manpower and oven space. 2. Simple to apply with pressure type spray gun. Varying degrees of texture obtainable from same mix by gun adjustment. 3. PEBBLE-TEX pattern in one coat. For full metal protection use over a primer. 4. Comes in a variety of colors.**



Here are actual photographs (unretouched) of PEBBLE-TEX finished panels. Above shows coarse texture.

This shows a finer texture. The size of the pattern is regulated by spray gun adjustment and application technique.

Send today for trial order at drum price. Write to Dept. MR

THE EGYPTIAN LACQUER MANUFACTURING CO.
Rockefeller Center, New York, N. Y.

EGYPTIAN Superior FINISHES

Protection of Steel by Coatings of Zinc and Cadmium

By I. LAIRD NEWELL

The Henry Souther Engineering Company

THE annual loss of iron and steel due to corrosion has been estimated to be approximately 2 per cent of the total tonnage in use. A part of this loss represents a waste of materials and equipment that could be saved by the use of protective coatings.

Many types of coatings, both metallic and organic, are suitable for protection against corrosion, but due to the present scarcity of materials and the war needs of the Army and Navy, only a few types are permitted. Cadmium and zinc coatings are among those specified by the Army and Navy for protective purposes.

Table I gives a list of some of the specifications now in force for plated cadmium and zinc.

	Cadmium	*Zinc*
American Society for Testing Materials	A 165-40T	A 164-40T
Army-Navy Aeronautical	AN-QQ-P-421	AN-P-32
Navy Specification	46-P-1	46-P-2

TABLE I.

While these protective surfaces may be applied by such methods as hot dipping, cementation and spraying, this discussion is to be limited to the coatings produced by electrodeposition. According to Soderberg[1], more than 81 per cent of the cadmium metal produced during the first four months of 1942 was used for electro-plating and practically all of this for military purposes.

Due to the tremendous increase in output of military equipment, the amount of cadmium available is not sufficient for all needs, and zinc must be substituted where it may be suitably used. Because of the amphibious type of warfare now being waged and the need for protection

MICCRO Products Will Meet These Protective Coating Requirements

THE protective coating materials manufactured by Michigan Chrome and Chemical Company have a wide range of applications. Listed here are the most important of these, and for which Miccro Products have been specially developed.

One of these materials will meet your needs

MICCRO-SUPREME STOP-OFF LACQUERS

★

MICCROLITE

★

MICCROFLEX

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KOILKOTE

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MICCROSTRIP

- Insulation of plating racks used in practically all cleaning and plating cycles.
- Masking parts for hard chrome plating.
- Masking parts for selective hardening.
- Speedy removal of lacquers used for masking parts for hard chrome plating or selective hardening.
- Insulation of wire baskets used in washing and pickling processes.
- Insulation of anodizing racks.
- Protection and beautification of natural and plated finishes.
- Protection of coils used in rust proofing systems.
- Prevention of rust on parts in storage or transit.

If you need a material for any of these purposes, you will find Miccro Products highly effective, extremely economical and easy to apply and remove. Information concerning their use for any specific application will be supplied gladly by any Miccro sales representative or will be sent directly from the plant upon receipt of your inquiry.

Developed and Manufactured by Experienced Platers

MICHIGAN CHROME & CHEMICAL CO.
6344 EAST JEFFERSON • DETROIT 7, MICHIGAN

against salt water corrosion, cadmium and zinc are the preferred metallic coatings.

Moist atmospheres or salt spray cause corrosion by electrochemical or galvanic action. There must be present two dissimilar metals or materials which can act as electrodes and a conducting medium such as water for corrosion to take place. An electric current is set up similar to that found in a primary battery at the expense of one of the metals. The amount of current formed and the strength will depend on the types of metals present and the conductivity of the conducting medium. Both cadmium and zinc protect steel from corroding in moist atmospheres and salt spray because of their galvanic action when coupled with iron. Metals such as cadmium and zinc which are electronegative to iron dissolve preferentially, thus producing an electric current which prevents the iron from being attacked and corroded.

In substituting zinc coatings for cadmium, or vice versa, the differences in chemical behavior of the two metals are important.

In the protection of steel, corrosion products of zinc are formed which are insoluble in the corroding medium, and these deposits tend to build up on the metal. Such deposits may interfere with mechanical action or clog such equipment as fine screens or perforated sheets. Under the same conditions, cadmium will produce soluble corrosion products which therefore do not build up on the equipment, and do not interfere with mechanical action.

The throwing and covering power of zinc plating solutions are inferior to cadmium plating solutions. Care must be taken in the plating of zinc on cup-shaped parts or parts with recesses. Special racking is sometimes necessary. Cast iron is difficult to plate with zinc.

While some embrittling action of steel results from pickling and plating with cadmium, even more embrittlement results from zinc plating. Moreover, due to the impervious nature of zinc to hydrogen, it is more difficult to relieve the embrittlement. Higher temperatures must be used in most instances.

A considerable difference between cadmium and zinc is to be noted in the case of protection in industrial and salt water atmospheres. Blum, Strausser and Brenner[2] have reported on a study of these metals for such

Use

RACKOTE SOLVENT STOP-OFF STRIPPER

X-1569, a combination of neutral solvents specially formulated for the effective and immediate removal of "Stop-Off Lacquers". . . eliminating the usual costly, and occasional damaging, method of stripping . . . neither acid nor alkaline . . . will not etch the finest plate or metal.

Simple to use: Immerse the coated item and leave in the stripper for the few minutes required to completely dissolve the stop-off coating.

Safe to use: Contains no benzol or other toxic vaporous solvents. Also widely used as a cleaner in preparation of racks for coating—and objects to be plated. It is performance-proven.

Write for Literature Now!

WYANDOTTE PAINT PRODUCTS CO.

protection. It was found that in industrial atmospheres, the protection afforded by cadmium and zinc coatings is proportional to the thickness of the coatings. The zinc coatings, however, were found under these conditions to be superior to those of cadmium for equal coating thicknesses. The cadmium coatings fail in about two-thirds of the time required for zinc coatings of the same thickness. Salt spray tests and immersion tests in salt solutions show cadmium coatings to last longer than zinc coatings of the same thickness. This accounts for the fact that some of the specifications covering military equipment require greater thicknesses of zinc than cadmium.

In view of the foregoing considerations, complete information regarding the use of parts to be plated with cadmium or zinc is desirable and a choice of the two materials should be made only after a thorough study of all the factors involved.

References

[1] Soderberg, Gustaf: The Review—Amer. Electroplaters Soc.—Jan. 1943.

[2] Blum, Strausser and Brenner; Research Paper RP 867, National Bureau of Standards.

PUT THESE OPERATIONS INTO THE PRODUCTION LINE--

PREPARATION
Precleaning - Washing
Degreasing - Pickling
Rust Removal
Burnishing

PROTECTION
Rust Protection
Bonderizing
Parkerizing

FINISHING
Painting - Baking
Plating - Drying
Cooling

There's no need for interrupting smooth, speedy mass production of metal objects with slow, intermittent manual operations for preparation, protection and finishing.

MAGNUS
METHODS MATERIALS MACHINES
designed to fit your particular requirements will insure better quality and faster, more economical production. Let us show you what we can do to put these operations on a modern, completely automatic basis.

Write for Your Copy of the Magnus Metal Cleaning Handbook

MAGNUS CHEMICAL COMPANY
41 SOUTH AVENUE, GARWOOD, N. J.
Service Representatives in principal cities

Magnus CLEANERS-METHODS-MACHINES

Let's get on with the war

...AND SPEED THE AMMUNITION

with PENNSALT CLEANERS!

Reg. U. S. Pat. Off.

Let's keep hitting the Axis with everything we've got! If you have a metal cleaning operation, let us show you what a Pennsalt Cleaner can accomplish in getting it done in less time—or at less cost—or with more output.

Take this case for example: A well-known steel company was producing 0.30, 0.50 and 0.55 calibre cups for bullet jackets. Involved was a continuous washing, annealing, quenching, pickling and rinsing process. The components were carried through a perforated shell partly submerged in the cleaning solution.

When the Pennsalt serviceman called, he found that the cleaner then in use was only partly effective. Unsaponified oil was burning off in the annealing furnace, creating smoke and soot—and because the perforations in the shell became clogged, there were repeated delays due to cleaning difficulties.

When a fresh solution of Pennsalt Cleaner was used in the tank at one ounce per gallon concentration—*delays and cleaning difficulties stopped at once!*

Let our experienced technicians help you with *your* metal cleaning problems. Actually billions of cartridge cases, shell cases and bullet jackets—as well as great quantities of other ordnance and armament—have been most successfully cleaned with Pennsalt Cleaners.

Consultation involves no obligation. Write fully—Dept. MR.

PENNSYLVANIA SALT MANUFACTURING COMPANY

Chemicals

1000 WIDENER BUILDING, PHILADELPHIA 7, PA.

New York • Chicago • St. Louis • Pittsburgh • Minneapolis
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Important Announcement

LEA MFG. CO. OFFERS CONVENTION FILM

It will be recalled that the Grand Rapids Branch took moving pictures of the Convention in 1942 and later sold the rights to exhibit the film to the Lea Mfg. Co. The film was received during the fiscal year 1942-1943 by the various branches with such enthusiasm the Lea Mfg. Co. decided to sponsor a similar film of the Buffalo Convention. The film is now ready for showing before any Branch of the American Electroplaters Society.

Educational Chairmen of local branches are requested to write as soon as possible to:

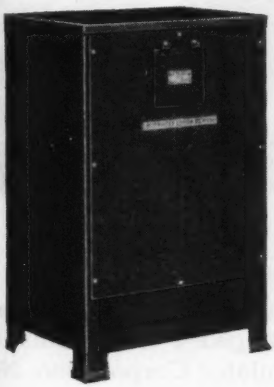
The Lea Mfg. Company,
16 Cherry Avenue
Waterbury (86) Conn.
Attention: Mr. E. W. Couch

Early reservations will assure branches of obtaining the film and avoid disappointment.

Along with the Convention film the Lea Mfg. Co. offers an optional film, one of the few color films in existence, illustrating the exact method for heading up manually a hard wheel, or semi-hard wheel with fast cutting abrasive composition. This film will be sent along with the Convention film if desired.

Both films are 16 mm and suitable for projection on silent apparatus. It is desirable to use a reliable make of projector, such as Keystone, Bell & Howell or Eastman to avoid objectionable wear on the film.

These films are offered at no cost to the branches. The only request by the Lea Mfg. Co. is that the Branch assume express charges on the film to and from Waterbury.



A Problem in Electroplating and How It Was Solved

The Problem

An Eastern plating company had a contract for anodizing aluminum parts. The contract would be completed in about 9 months. The job would require a power supply of 500 amperes, 40 volts.

When, if ever, there would be another job requiring 40-volt equipment was uncertain. Most likely the next job would be low-voltage plating requiring 6 volts. The problem was: What equipment would serve both these widely different requirements.

The Solution

Here's how the needed flexibility was obtained: Seven standard 500 ampere, 6-volt G-E Copper Oxide Rectifiers were purchased. By a series connection and regulator control, this equipment was adapted to operate over a range from 1 to 40 volts at 500 amperes. When the contract was completed, the same equipment was relocated at two different points in such a way that 4 units were used for a plating job requiring 12 volts, 1000 amperes, while the other 3 units were set up on a job requiring 6 volts, 1500 amperes.

This illustrates only one of the many electroplating power supply problems that can be solved through flexible G-E Copper Oxide Rectifiers. Whatever your problem, General Electric Metallic Rectifier Engineers will be glad to consult with you. For additional information, write to Section A933-106, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC

One Operation with

MOLDING an idler crank in rag-filled Bakelite left a heavy flash at the parting lines—and dumped a stiff production problem right in the lap of American Insulator Corporation, New Freedom, Penna.

Formerly, each part was hand-filed to remove flash and the resulting seam was buffed. It was a slow process, so they searched for and found a better and faster way.

> *"The laborious process was eliminated by the use of a single LEA COMPOUND operation. LEA COMPOUND is used on a soft cloth buff 7" in diameter, running at a speed of 2350 R.P.M. This change to LEA COMPOUND has permitted a definite SAVING in COST and TIME, and PRODUCES A BETTER FINISHED APPEARANCE than was possible by the hand-filing method."*

To meet other war production needs, LEA engineers have developed many new techniques. For example, by the use of various types of cone-shaped bobs, operating on a tapered spindle, counter-

LEA Compound

Eliminates Hand Filing

reports
American Insulator Corporation*

*Photographs and data courtesy American Insulator Corporation.

sunk holes of varying diameters can be burred effectively without filling threads or holes with foreign material.

Write LEA in detail about your burring, polishing, or buffing problem. Invite a LEA engineer to call for a consultation. He will gladly help you solve your problem.

THE LEA MANUFACTURING CO.

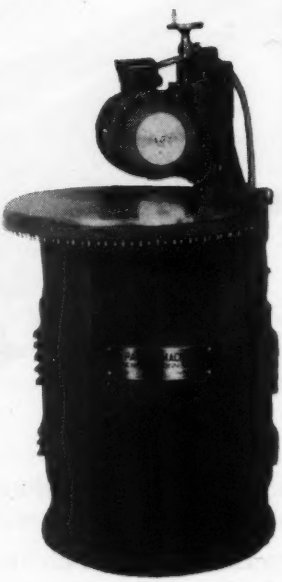
Waterbury 86, Conn.

Burring, Buffing and Polishing . . . Specialists in the Development of Production Methods and Compositions

9-LM-4

NEW Equipment Materials Supplies

PACKER MACHINE CO. ANNOUNCES NEW MACHINE



Another Packer-Matic achievement is the No. 7 Continuous Rotary Grinding, Deburring, Polishing and, or, Buffing Machine.

The No. 7 Packer-Matic is primarily used for deburring operations on studs, screws and various special shapes.

Its construction is rugged and compact with built-in flexibility for a wide range of sizes. A second head or wheel can be attached for producing multiple operations.

The table, on which are mounted fixtures, or holding devices, runs on a ball bearing spindle properly designed and constructed, not only for long life but for ease and accessibility in making changes.

Attachments are provided for automatic discharge of work being finished and hopper feeds can be used wherever practical.

The pedestal or base is fully enclosed and includes dust-tight cabinet as integral part for all electrical controls.

Wheels may be either mounted in vertical or horizontal positions as required.

Diameter of table 25½". Height of table from floor 36". Floor space required 28" x 47". Main drive motor ½ Horsepower. Motor for driving wheels, 1 Horsepower or larger as required.

NEW BONDING METHOD REPLACES RIVETING OR SPOT WELDING FOR METAL ASSEMBLY

A method of bonding metal to metal, or rubber, synthetic rubber, plastics, leather or wood to metal, or to each other, with a bond in most instances stronger than the materials themselves, has recently been announced by The U. S. Stoneware Co., Akron, Ohio.

The new process, known as the Reanite Bonding Process, develops a bond—metal to metal—which in repeated tests has shown itself to be stronger than riveted or spot welded joints. The normal bond between metals ranges from 1000 #s psi to as high as 3000 #s psi. The bond developed between rubber and metal ranges from 900 #s to as high as 2000 #s compared to the average 250-400 # bond obtained by convention processes. On tests of bonds formed between natural rubber, synthetic rubber, plastics, leather and wood, the materials themselves gave way before the bond.

The Reanite Process is suitable for use with almost all metals—iron, steel, stainless steel, magnesium, aluminum, aluminum alloys, copper, bronze and brass.

The application of the process is simple. The surfaces to be joined are brushed, sprayed or dipped with Reanite. After drying, mild heat and pressure is applied.

The Reanite joint is unaffected by fresh or salt water, is non-corrosive to metals, possesses excellent corrosion-resistance in itself, and high dielectric strength. While the bond develops its maximum strength at room temperatures, its strength over a temperature range of from $-40°$ F. to as high as 300° F. is substantially stronger than bonds obtained by conventional processes.

Present uses include fabrication of aeroplane sub-assemblies, motor mounts, sound and vibration damper assemblies, instrument mounts, composite metallic and plastic units, and others. Future uses forseen include pre-fabricated housing units, metal-clad plywood for kitchen cabinets, boats, airplane assemblies, etc.

NEW WHEEL SPEED TABLE

Those engaged in polishing and buffing will welcome a copy of a new Wheel Speed Table just published by Divine Brothers Company of Utica, New York. It has been condensed to permit easy pocket insertion for quick reference on the job.

To simplify its use, the preferred or recommended speeds are shown in red. Where two red figures appear in a vertical column, the lower speed is for polishing, the higher for buffing.

If the user so chooses, the front of the folder may be removed, the Wheel Speed Table proper folded on scored dotted line to a size 3" x 4" that fits easily into a shirt pocket. A copy may be had by writing the Engineering Department, Divine Brothers Company, Utica 1, New York.

OAKITE ISSUES SPECIAL SERVICE REPORT

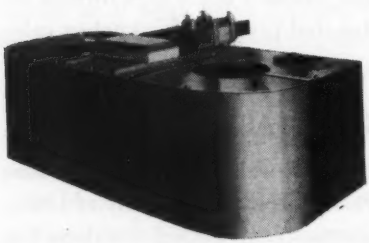
The trend to bright zinc due to the shortage of cadmium for the finishing of ordnance matériel and other vital war supplies, stresses anew the value of degreasing methods and techniques that aid in obtaining proper surface preparation of work. Just issued by Oakite Products, Inc., New York, is a new 6-page Special Service Report telling how plating departments and contract finishing shops can speed-up the cleaning of metal surfaces and minimize or eliminate rejects before the application of protective zinc coatings.

This Report concisely reviews still tank and cathodic cleaning as well as anodic degreasing for removing smut, dirt, grease, quenching oils, cutting oils, drawing and stamping compounds and other accumulations from metal surfaces. In addition, it includes data on pre-soaking techniques, to be used whenever required, that aid in securing chemically clean surfaces.

Helpful tips and suggestions are also given on the use of pickling treatments and acid baths for removing oxide, scale and rust.

Free copies of this informative Special Service Report are available on request. Write to Oakite Products, Inc., 40 Thames Street, New York, 6, N. Y.

HOLDEN TYPE 230 HIGH SPEED HEAT TREATING UNIT



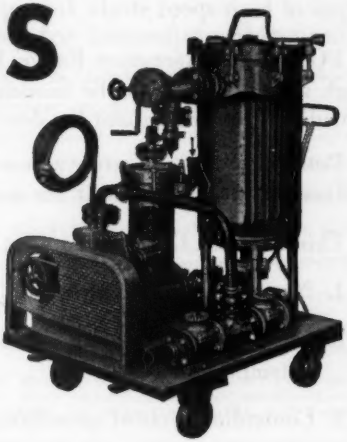
The photograph at the left shows our type 230 unit which is extremely versatile, consisting of three pots:

POT #1—Temperature Range 1400° F. to 1800° F., for preheating high speed tools, for heating water and oil hardening steels, alloy steels such as high carbon-high chrome or stainless types, for carburizing and for silver soldering.

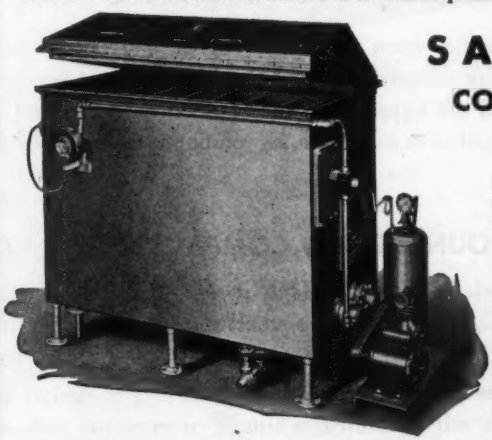
FILTERS

For

BRIGHT NICKEL
NICKEL
CHROME
COPPER SULPHATE
CYANIDE COPPER
BRASS AND ZINC
CADMIUM
HIGH SPEED COPPER
BRITE ZINC
SILVER
ELECTROCOLOR
AND OTHERS



INDUSTRIAL FILTERS will do a fine job of filtering and purifying your plating solutions, at the lowest possible cost per filtered gallon.
INDUSTRIAL FILTERS have larger filter areas, more sludge holding capacity and higher pressure pumps, which insures high flow rates and longer filter cycles.
The "LEAK-PROOF", "CORROSION-PROOF" and non-contaminating construction of Industrial Filters is a vital requisite of Electroplating filters.



SALT SPRAY
CORROSION TEST EQUIPMENT

For testing—Electroplated or coated metals at 95 deg. Fah. in accordance with Army, Navy and Aeronautical specifications, as outlined in Bulletin AN-QQ-S-91-5 dated Dec. 1938. Also for controlled temperatures at any degree. Testing Cabinets lined throughout with rubber. Made in 4 sizes.

"Write for NEW Literature and particulars"

INDUSTRIAL FILTER & PUMP MFG. CO.

1621-25 WEST CARROLL AVENUE CHICAGO, ILLINOIS

POT #2—Temperature Range 1900° F to 2350° F., for hardening all types of high speed steels, for copper brazing and for heating forgings.

POT #3—Temperature Range 1000° F. to 1400° F., for quenching high speed tools from the hardening temperatures, for tempering, for nitriding, for blueing and for descaling forgings and similar parts.

Pots #1 and #3 are removable and interchangeable, permitting several different baths to be used in the same furnace unit.

This new HOLDEN three-in-one unit has the following advantages :

1. No scale at any temperature.
2. Tools hardened—with minimum diameter change, regardless of temperature.
3. Controlled cycle of quenching for maximum physicals.
4. Uniformity of hardness and heating on thin or heavy sections.
5. Minimum distortion. Less time required for finishing.
6. Many types of tools such as form tools, hobs, taps, etc., are now hardened to size without refinishing.
7. One-third less time for subsequent finishing operations.

This type of hardening has been successfully proven by many tool manufacturers and is being adopted by many commercial heat treating concerns, because many of the newer types of steels have been found to work out far better heat treated in salt baths, as compared to atmospheric furnaces.

READY-POWER ANNOUNCES NEW COMPACT MODEL "J"

The Ready-Power gas-electric power plant, model "J" was brought out to supersede model "G." Model "J" is a smaller over-all model with greater power capacity.

READY-POWER accessibility is again improved in the design of the Model "J". Completely self-contained, a hinged cover at top permits quick servicing of radiator, fuel tank, battery and oil filter while a similar cover at the front provides easy access to air cleaner, carburetor, fuel pump, distributor, charging generator, governor, oil filter and oil level indicator. All engine accessories are readily removable. Automatic

FOR SALE Available for Immediate Shipment

3—5000/2500 AMPERE, 6/12 VOLT, **A. P. MUNNING CO. "OPTIMUS"** Motor Generator Sets. Full Panel-Board Arrangement. Excellent Condition.
3—5000/2500 AMPERE, 6/12 VOLT, **EAGER ELECTRIC CO.** Motor Generator Sets. Excellent Condition.
1—5000 AMPERE, 6 VOLT, **JANTZ & LEIST** Motor Generator Set. Full Panel-Board Arrangement. Excellent Condition.
1—4000/2000 AMPERE, 6/12 VOLT, **EAGER ELECTRIC CO.** Motor Generator Set. Excellent Condition.
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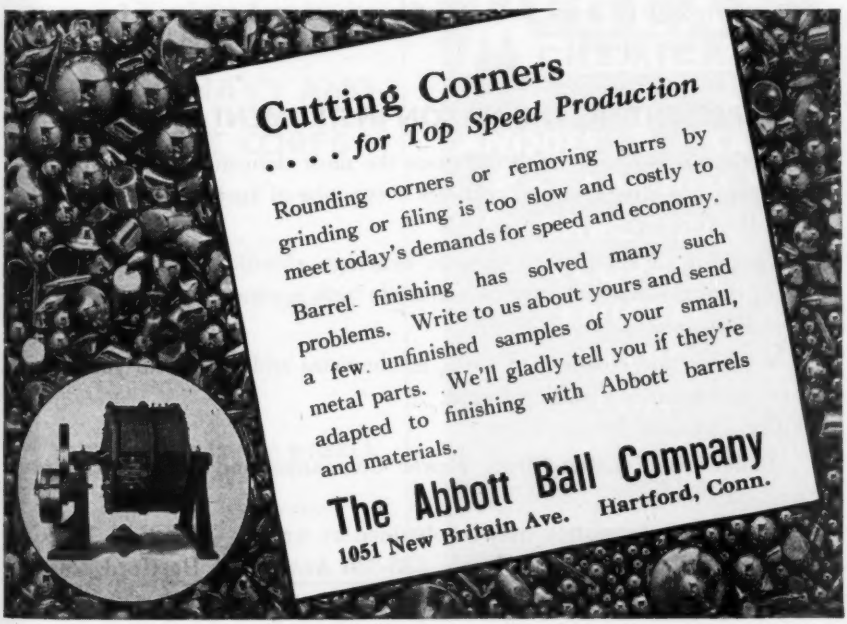
1—2000 AMPERE, 6 VOLT, **HANSON & VAN WINKLE CO.** Motor Generator Set. INTERPOLE DESIGN. Separately Excited. Excellent Condition.
1—1500/750 AMPERE, 6/12 VOLT, **CONNECTICUT DYNAMO & MOTOR CO.** Motor Generator Set. Excellent Condition.
1—1500/750 AMPERE, 6/12 VOLT, **COLUMBIA** Motor Generator Set. Excellent Condition.
1—1000 AMPERE, 6 VOLT, **IDEAL ELECTRIC CO.** Motor Generator Set. Excellent Condition Throughout. Full Panel-Board Arrangement.
1—1000 AMPERE, 8 VOLT, **JANTZ & LEIST** Motor Generator Set. Excellent Condition.
1—1000 AMPERE, 6 VOLT, **JANTZ & LEIST** Motor Generator Set. Excellent Condition.
1—800/400 AMPERE, 6/12 VOLT, **EAGER ELECTRIC CO.** Motor Generator Set. Full Panel-Board Arrangement. Excellent Condition.
1—500 AMPERE, 30 VOLT, **WOTTEN ELECTRIC CO.** Motor Generator Set for Anodizing. Full Panel-Board Arrangement. Excellent Condition.
1—NEW **LASALCO, INC.,** SINGLE #2, MOTOR DRIVEN BURNISHING BARREL. No Priorities Required.

M. E. BAKER COMPANY 143 SIDNEY STREET CAMBRIDGE, MASS.


Cutting Corners
. . . . for Top Speed Production
Rounding corners or removing burrs by grinding or filing is too slow and costly to meet today's demands for speed and economy.
Barrel finishing has solved many such problems. Write to us about yours and send a few unfinished samples of your small, metal parts. We'll gladly tell you if they're adapted to finishing with Abbott barrels and materials.
The Abbott Ball Company
1051 New Britain Ave. Hartford, Conn.

idling obtained through Ready-Power patented syncotrol governor saves fuel and engine wear.

The unit consists of a gasoline engine closely coupled to a direct current generator complete with all accessories mounted in a steel housing for fastening to the truck chassis. Electric power is thus generated on the truck and delivered to the truck motors through standard electric truck control mechanism.

READY-POWER gas-electric drive is particularly adapted to powering heavy-duty trucks. Trucks of this size represent a larger investment and must be given an ample, reliable, unfailing source of power for their Profitable operation. READY-POWER model "J" units generate, as required, all the power that can be used on these machines. Power is always available and maximum truck performance is always possible.

Flexibility and ease of control are of utmost importance in handling 10- to 30-ton loads. Power steering as used on many of these trucks together with full-electric control of all truck motions, are available only in electric truck. These refinements which add greatly to the truck's ability take added power. Ready-Power gas-electric drive with a practically unlimited power source, insures maximum truck performance.

In addition to heavy-duty model "J" units, other Ready-Power units in several sizes, are manufactured to give a complete coverage of the entire electric industrial truck field—for the operation of trucks of from one-ton to 30-ton capacity.

PRESENTING THE NAXON INSTRUMENT WASHER

It thoroughly and safely cleanses the most delicate instruments and mechanisms—dissolves and removes every type of foreign matter.

For Production:—

Cleaning of small parts, jewels, bearings, spindles, screws, odd and complicated shapes of various materials both mechanical and electrical.

For Maintenance:—

Washing and cleaning of parts, mechanisms and units with your own proven solvent or cleaning liquid.

Fully Endorsed by:—

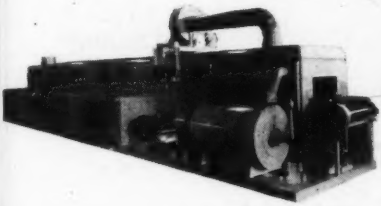
Underwriters Laboratories, Power Companies and many War Production Plants.

Complete information may be obtained by writing GENERAL ELECTRIC SUPPLY CORPORATION, 338-346 Ann Street, Hartford, Conn.

HYDRO-FLOW

INDUSTRIAL WASHING MACHINES

BONDERIZING EQUIPMENT



Streamlined design. Recirculating hot or cold air blow off. Hidden motors, pumps and pipes are easily accessible. Piping and nozzles located to insure thorough cleansing of all surfaces. Rugged and efficient pressure pump. Corrosion resistant spray nozzles—from mist to open stream. Handling alkali to varsol as cleaner. Monorail, Belt, or Gravity type conveyors designed to carry any shape or size material. Variable speeds on conveyor drive synchronize production.

INTERNATIONAL CONVEYOR & WASHER CORP.

Write for circular

652 E. FORT STREET, DETROIT 26, MICH.

Parts for the

ARMY, NAVY AND MARINE CORPS

Are finished with

ADVANCE

Polishing Wheels

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ADVANCE-POLISHING-WHEELS, INC.

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• NICKEL

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• TIN

USED BY THE LEADERS IN THE INDUSTRY

THE McGEAN CHEMICAL COMPANY

CLEVELAND, OHIO

McINTYRE TO PENNSYLVANIA SALT

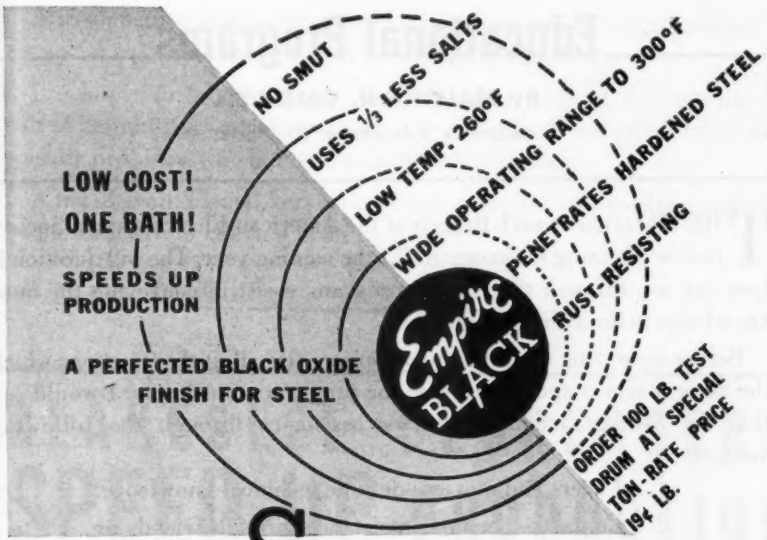
The Pennsylvania Salt Manufacturing Company of Philadelphia announces the addition of Horace F. McIntyre to its Pennsalt Cleaner Division as a sales and service representative to cover the Philadelphia territory.

Glasstone Book Going Fast!

We are now able to make immediate shipment of GLASSTONE'S Book, "The Fundamentals of Electrochemistry and Electrodeposition." Because of paper limitations a reprint cannot be made for another year. Over half of the first printing has been sold. Avoid disappointment — *order* today! Price $2.00.

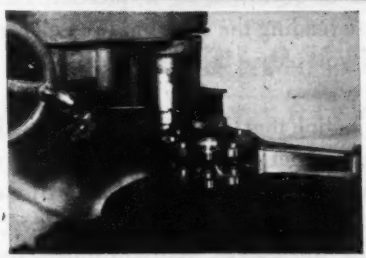
American Electroplaters Society

545 Fifth Avenue · New York 17, N. Y.



EMPIRE SOLVENTS CORP.
170 BROADWAY, NEW YORK 7, N Y
Detroit: Edw. F. Berry Co., 6432 Cass Avenue

Solving the Man-Power Shortage
in POLISHING . BUFFING . WIRE BRUSHING . BURRING



Special Acme Machine for polishing engine parts. More uniform production — and no scrap.

Put "Acme" Automatics
On the Production Front!

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ACME *Manufacturing Co.*
1642 HOWARD ST. • DETROIT, MICH.
Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 25 YEARS

Educational Programs

By MAURICE R. CALDWELL
Chairman, Educational Programs

THE Librarian of each Branch of the American Electroplaters' Society is now planning his program for the coming year. The big question is how can we, through the type of program, assist in conveying the most knowledge to the average member?

Before answering this, one should summarize all of the functions which the Society serves and then divide the program accordingly. I would say that the average member receives assistance through the following methods:

1. Papers and movies—definite technical knowledge.
2. Contacts—personal assistance through friends or new acquaintances.
3. Social enjoyment.

We all realize that each meeting should include a speaker, whose paper is often given after a movie. Do not fail to engage someone for each meeting. Be sure it is advertised by programs or monthly announcements to each member. Have these announcements posted on bulletin boards in factories, schools and colleges.

We must see that adequate time is taken for questions concerning the paper of the evening. This should be followed by a question box for general problems. We all appreciate reading the questions and answers in the Review, so Mr. Librarian, will you please be sure to send them in to our editor?

Now comes the next important function that the meetings serve, which is —"contacts". This assistance to the member is often overlooked. We must provide the proper environment so that members and guests will stay in the meeting room and become acquainted. If they are acquainted, this gives them time to discuss problems. Remember, many problems cannot be discussed publicly, but assistance can be gained privately.

I believe it is well worth while for the branch to serve refreshments for this purpose. Refreshments after every meeting is good, even if those attending pay a small fee for the expense. Sandwiches and coffee do very well.

Also remember that while you serve the refreshments, you are adding to the social enjoyment as well as the educational assistance.

It is hoped the above suggestions are helpful. At least, they are the result of several years of observation. It is recognized that each branch has specific problems which must be dealt with separately.

A list of available speakers is now being compiled by the writer and will be published in the Review at an early date.

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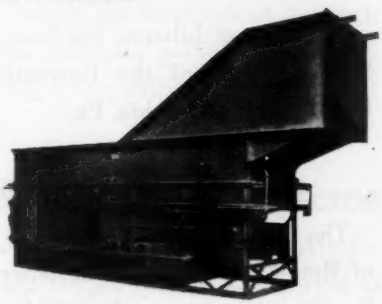
We would welcome the opportunity of discussing the application of Blakeslee Degreasers or Metal Parts Washers with you and just how your production may be speeded and cleaning costs cut. An engineer will be pleased to call on you without obligation on your part.



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INDUSTRY NEWS

FOREMAN WANTED IN JOB SHOP

Supervisory Foreman for Electro Plating, Polishing, Painting, in a Job Shop doing War Work located in Middle West. Give experience, ability, references.

JULIANNE PROMOTED

Mr. Vernon Julianne has been promoted to the position of Plating Superintendent of the International Resistance Co., at 401 North Broad St., Philadelphia, Pa.

STURGIS ADDS DISTRIBUTORS

The Sturgis Products Company of Sturgis, Michigan, manufacturers of Roto-Finish and various other Mechanical Finishing Supplies and Equipment, announce the appointment of the following as distributors for their products:

Wagner Bros., 1249 Holden Ave., Detroit; F. B. Stevens, Inc., 510 Third St., Detroit; MacDermid, Inc., Waterbury, Conn.; Munning & Munning, 202 Emmett St., Newark, N. J.; Crown Rheostat & Supply Co., 1910 Maypole Ave., Chicago; Geo. A. Stutz Mfg. Co., 1641 Carroll Ave., Chicago; Lasalco, Inc., 2820 LaSalle Ave., St. Louis; Sommers Bros., 3439 N. Broadway, St. Louis; W. M. Fotheringham, 977 Niagara St., Buffalo; W. D. Forbes Co., 303 Washington Ave. N., Minneapolis; The Reynolds-Robson Supply Co., 4623 Paul St., Frankford — Philadelphia.

WEST COAST DISTRIBUTION FOR GREEN ELECTRIC

Green Electric Sales Corporation announces that their Selector-Platers and Multi-Platers are new being distributed on the Pacific Coast by The Hill Electric Company, 2600 South San Pedro Street, Los Angeles, California. This arrangement is the result of the recent trip made by Mr. E. I. Huppert, Jr. of the Green organization. Mr. Huppert spent some time with The Hill Company familiarizing them with the finer details of Green selenium rectifiers so that The Hill Company is now qualified to give the West Coast expert personal service.

HATHAWAY TO PACKER MACHINE CO.

Mr. R. H. Hathaway, formerly Assistant Chief Engineer for Hammond Machinery Builders has joined the Packer Machine Co., Meriden, Conn., as Sales and Service Engineer.

Mr. Hathaway has devoted several years to the development, research and application of special, semi and full automatic polishing, deburring and buffing machinery, which is playing a very important part in vital defense industries.

PENNSYLVANIA SALT ELECTS CHAS. G. BERWIND DIRECTOR

The Pennsylvania Salt Manufacturing Company of Philadelphia announces that its Board of Directors has elected Charles G. Berwind as a Director of the Company to fill the vacancy caused by the death of William M. Potts. Mr. Berwind is Vice President and Director of the Berwind-White Coal Mining Company and is also a Director of The Pennsylvania Company for Insurances on Lives and Granting Annuities and of the Philadelphia Orchestra Association.

RENSON JOINS TURCO PRODUCTS, INC.

Kurt W. Renson, industrial chemist, who has joined the Los Angeles laboratory staff of Turco Products, Inc. Renson is a member of the American Chemical Society and was graduated in 1930 from the College of Industrial Chemistry in Vienna.

C. C. HELMLE JOINS ENTHONE COMPANY

Dr. Walter R. Meyer, Technical Director of The Enthone Company, New Haven, Conn., has announced that on August 16th Clarence C. Helmle joined the technical staff of the company. Mr Helmle is a chemical engineer, a graduate of Rensselaer Polytechnic Institute, class of 1932. After graduating, he went with the General Electric Company's Bridgeport Works, where he was successively plating analyst, chemist and finally head of the Inorganic Laboratory in charge of electroplating, metallurgy and general chemistry.

Mr. Helmle has been very active in electroplating. He is Supreme Second Vice-President of the American Electroplaters' Society and past officer of the Bridgeport Branch of the Society. He is a member of the Electrochemical Society and was an instructor for several years in chemistry, electrochemistry and metallurgy at the Bridgeport Engineering Institute. He has contributed ten articles to the electroplating literature.

Mr. Helmle will be engaged in plating equipment design, process development and technical service.

THE EVENING DEFENSE TRAINING PROGRAM

The Hartford Branch of The American Electro-Platers Society in cooperation with the Federal Defense Training Program is planning to conduct a course in "Metal Finishing in War Time." This course is aimed primarily at men already familiar with metal finishing.

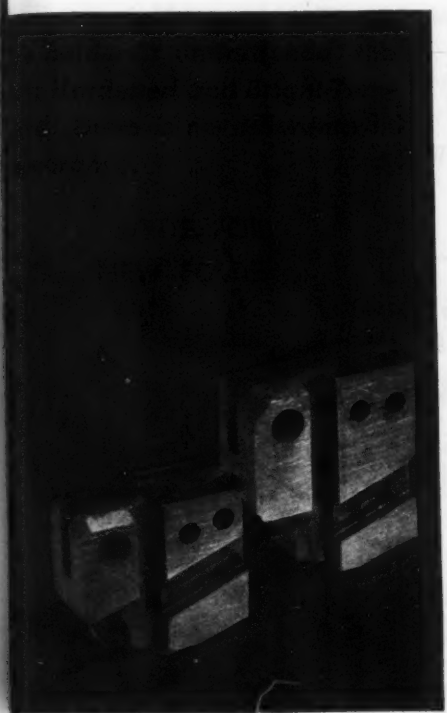
The course is tentatively scheduled for one evening weekly beginning early this fall.

HOLDEN BRIGHT TEMPER

Operating Range: 750 - 1200° F.

This bath is used to temper steel parts with a clean metallic finish. Parts hardened scale free in a suitable heat treating bath or in a controlled atmospheric furnace can be tempered in this bath without any scale or temper colors. It can be used for all types of steels except the high speed steels. (For high speed steels, Tempering Hardening 3-10A or 8-15 salts are recommended.)

The handling of parts for a bright finish is the same tempering operation as normal. At the completion of the tempering operation, the parts should be quenched in clear running water, producing a bright surface free from corrosion or pitting.



This bath may also be used on parts for removing scale, ranging in thickness from .001-.005"; thus eliminating the necessity of sandblasting or pickling before machining.

When parts have been scaled during previous heat treating operation, tempering in this bath will not produce a bright surface finish. However, the scale will be removed eliminating pickling or sandblasting before grinding or machining.

This bath effects saving by:

1. *Eliminating cleaning after tempering.*
2. *Reducing handling operations.*
3. *Eliminating sandblasting.*
4. *Cutting down grinding or machining operations.*
5. *Parts may be plated, lacquered, painted or shipped where no subsequent machining or grinding is necessary. (To accomplish these results — parts must be hardened free from scale.)*

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NEWARK TO HOLD EDUCATIONAL SESSION

The members of the Newark Branch of the A. E. S. are having an Educational Session on October 23rd at 3:30 P. M. at the Hotel Robert Treat in Newark. At 7:00 P. M. of the same evening, there will be a testimonial dinner for Mr. Horace Smith and Mr. George Wagner.

Speakers scheduled to address the meeting are listed below as well as the subjects on which each will speak:

Albert MacLeod, of Dow Chemical Co.: "Finishing of Magnesium."

Frank C. Mesle, of Oneida, Ltd.: "A Study of Adherence and Corrosion Resistance of Silver Plate on Steel."

Myron B. Diggin, Hanson-Van Winkle-Munning Co., "Lead Plating."

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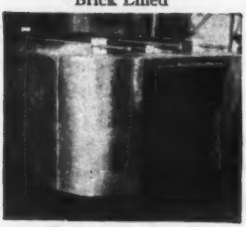

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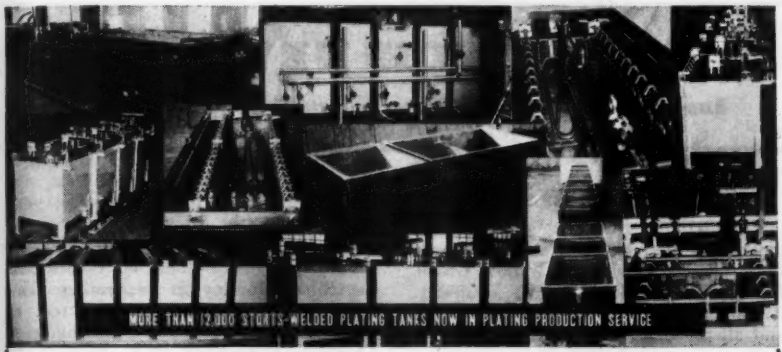

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BRANCH NEWS

Business and Social News · Educational Activities

PHILADELPHIA BRANCH

Philadelphia Branch A.E.S. officers meeting at the home of Treasurer George Long, 47 E. Welsh Rd., Willow Grove, Pa., opened at 8:30 P. M., Thursday, August 19, 1943 with President Verrell and all the officers present.

The minutes of the previous meeting were approved as read.

Benjamin Minkin, active, was elected to membership after approval by the Board of Managers.

Motion — Dinner meeting in September left in the hands of the Entertainment Committee. Carried.

The Entertainment Committee decided to have the dinner at the Broadwood Hotel, Broad and Wood Sts., Philadelphia, Pa., on the regular 4th Friday of September at 7:30 P. M. Henry Orlik, the librarian, promised to have a speaker for the evening.

Motion — Yearly Banquet or Social Nite be turned over to the September meeting for Branch discussion. Carried.

We bid "Good Night" to the Treasurer at 10:45 P. M.

PAUL MENTZER, *Secretary*

HARTFORD BRANCH

A special meeting was held on the evening of July 8, 1943, at the home of President Ken Bellinger. Plans concerning the program for the coming year were thoroughly discussed and formulated. The first regular meeting for the coming year will be held in Hartford on the third Monday in September. The following applicants were elected to membership: R. L. Payne, T. Voyda, J. Chappell, F. Duncan, E. K. Murphy, L. C. Ruggerio, L. J. Brushie, T. J. Finn, Jr.; H. J. Clough, J. E. Ready, L. St. Onge. The following applications were accepted: T. P. McFarlane, A. J. Dankevich.

INDIANAPOLIS BRANCH

Minutes and Secretarys report of the meeting of the Indianapolis Branch held at Hotel Riley, May 5th, 1943.

After a delicious steak dinner, the meeting was opened by the new President, Mr. Thomas Evans, in the absence of Mr. Richard T. Hennessey who was reported ill at his home. The register was passed around and signed by those present. The total number present at the meeting was 18. The 31st Annual Convention to be held at Buffalo, N. Y., was discussed and all members were urged to attend if at all possible. Ballots were then taken to select the delegate to represent the Indianapolis Branch at the Convention. Mr. James J. Monagle was elected as the branch delegate, with Mr. Thomas Evans, Mr. William Laux, and

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Mr. D. L. Patrick as first, second, and third alternates respectively.

A short business session followed. Six new membership applications were presented for approval of the board of managers, and two applications for transfer into the branch. Announcement was made that branch meetings would not be held during the summer months of June, July, and August; meetings to convene again September 5th, 1943. Announcements to be made at that time of the program. The subject of organizing an educational training program (which was left over from the previous meeting) to be sponsored by the Indianapolis Branch was discussed. The program is to be for the instruction and training of persons new in the electro-plating field of industry in this area due to the vast expansion of war industries and personnel involved, and as a refresher course of instruction for the old-timers.

Vocational Electro-Plating Training Program points discussed and outlined were:

1. Vocational Training to be entirely voluntary and the requirements for admission to the program of courses offered are that applicants be interested in electroplating or associated fields of endeavor.

2. Courses to be open to all persons (including women) engaged in the field of electroplating operations and associated fields of endeavor concerning electroplating, such as engineering, drafting, tool designing, chemical control, plant engineering, electrical, maintenance of electroplating equipment, etc., who have not previously had opportunities or means to obtain similar instruction.

3. Tentative outline of courses to be offered by the project are:

I. Elementary Chemistry. II. Fundamental Metallurgy of Electro-deposited metals. III. Basic Electro-Chemistry, Plating solution control, and Ohm's Laws and Faraday's Laws of electrolysis. IV. Plating Design of Equipment and Processing Tools. Courses to be job centered, not too theoretical. Courses to be designed to qualify students more effectively to perform their present duties and to make them available for upgrading in their field of endeavor, and for "trade preparation" needs.

4. Advisory Staff to be establsihed

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consisting of outstanding industrial men in the electroplating field in this area to guide vocational program.

5. Instruction assistance to be obtained from the State department of Vocational Education and the Defense Training Program and interested Universities. All Branch members to participate.

6. Course length and minimum "legal" hours per week under V.E.W.T. regulations to be established. Suggested course length was a 10 to 12 week period, with 2 three hour classes per week.

7. Expected enrollment to allow approximately forty persons per class.

Thereafter the meeting adjourned at 9:45 p.m. and small groups assembled in various parts of the meeting room for group discussions of their various electroplating problems.

The Indianapolis Branch of the American Electroplaters Society feels the urgent necessity for such a program in the present war effort, and to the best interest of the field of science of electroplating to sponsor a program of this kind in the advancement of progress. Comments on this undertaking and constructive suggestions from other branches who have previously participated in vocational training, and, from the readers of the Monthly Review will most sincerely be appreciated.

DONALD L. PATRICK, *Sec.-Treas.*

MILWAUKEE BRANCH

Milwaukee Branch Enjoys Fish Fry at Nagawicka. Mr. J. Birbaum again played host to the Milwaukee Branch at his cottage on Nagawicka Lake. He is a superb fisherman and little doubt remains in the minds of the Milwaukee members as to the veracity of his fish stories. A large table of fried proof was enjoyed by all.

After the very delicious meal the members spent the rest of the evening swimming, playing cards, and reminiscing. Some even stooped so low as to shoot crap.

Among those present: Mr. Robert Steuernagel Sr. and Mr. Harry Unke enjoyed their usual game of sheepshead. Mr. Everett Robinson and Mr. Davies walked around and viewed the surrounding scenery. Mr. Frank Buschner likes motor boating and is now known as "Scare the devil out of me Buschner." Mr. William Geissman had fun swim-

ming "sans attire." Mr. Jack Geissman has made a fine return to health and his former self. Mr. Axel Johnson just spent the evening, we'll say. Anyway he didn't lose any money. Mr. Stenberg was present. I think he mentioned something about plating, cleaning for bright nickel was his topic. Seems there was a time when they used nickel for plating. Mr. Al Hermansen spent the larger part of the evening brushing his teeth. Mr. Les Birbaum catered to the boat riders and gave everyone a fast ride around the lake.

The gathering broke up with many thanks to Mr. J. Birbaum, Mr. Les Birbaum, Mrs. Les Birbaum, and Mrs. Harry Unke for a very pleasant evening and fish fry.

JAMES-DURNFORD, *Secretary-Treasurer*

NEW HAVEN BRANCH

New Haven Branch held their regular monthly meeting on June 1st in Sterling Chemistry Laboratory of Yale University. Upon reading the role, the vice president and assistant secretary-treasurer were recorded as absent and only two members of the board of governors were present, namely, Joseph Sullivan and George Knecht. The minutes of the previous meeting were read by the secretary and although remarked upon by H. Kellner were accepted as read by the members present.

The only communication received was one from the chairman of the regional convention committee asking a consensus of opinion of the members regarding whether our branch should receive a division of the profits of the convention. A resolution was passed instructing the secretary to tell the regional convention committee that the branch stood ready to share the losses if any should occur, but that the committee should be the judge as to the way any profits resulting should be divided. A discussion was then started regarding a report on the convention which appeared in the May issue of the Monthly Review.

The New Haven Branch acknowledging the fact that they did not play their part in pre-convention activities, but yet gave their full support to the convention itself by their attendance, felt that the convention committee was entirely unwarranted in their remarks in the Review

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about the "one day life" of the branch. The members decided that the remarks did not express the spirit which should prevail at a regional convention to make it a success. All branches experience periods when for some unexplainable reason there is a slack in their activities, but these branches snap back with renewed interest in a short time.

The secretary then read the minutes of the meeting of the Board of Governors at which the books were audited for the year. In their report the board made recommendations whereby eleven members would be dropped from the society, and others who are not up to date on their dues would be warned that they would be dropped in the near future. The report was approved by the members present and the recommendations were carried out.

Jack English, chairman of the nominating committee, then reported on the nominating committee's choice for the coming year. The officers named were Walter Lynch, president; Kasmir Jaros, vice-pres.; Bernard Gaffney, secretary-treasurer, and Jess Whitney, assistant secretary-treasurer. "Hank" Kellner being in an objective mood that evening asked for a report from the committee as to why the committee followed the old system of rotation of officers when he thought it was to be dropped. The nominating committee convinced everyone that no such plan was followed and John Oberender made a motion which was passed and instructed the secretary to cast one ballot for the above mentioned slate. Also a resolution was passed informing the new president to instruct next year's nominating committee to meet uninstructed and to nominate whom they consider to be the very best members for the respective positions. The meeting closed at approximately 10:45 with the showing of two short pictures, "Yanks in Africa," and "Russia Stops Hitler."

WALTER T. LYNCH, *Sec.-Treas.*

PHILADELPHIA BRANCH

President Verrell called the officers meeting to order at his home July 22, 1943, at 8:30 P.M.

Harry Brown, Active, and Don P. Volino, Associate, were elected to their

respective membership after approval by the Board of Managers.

The Board of Managers recommended the suspension, for non-payment of dues, of Maurice Kraft, J. W. McCoombe, P. B. Ruppe, Nathan Vaneman, and E. F. Walker. Carried.

On motion, Henry G. Orlik and C. K. Goss, Associates, were advanced to Active membership. Carried.

Next officers meeting will be August 19th at the home of Treasurer, George Long.

Note—The next regular meeting will be Friday, September 24, 1943, at the Harrison Laboratory, of the University of Pennsylvania, 34th and Spruce Sts., Philadelphia, Pa., at 8:00 P.M.

PAUL MENTZER, *Secretary*

CHICAGO BRANCH

The regular monthly meeting of Chicago branch was held Friday, Aug. 13, at the Atlantic Hotel.

President R. J. Hazucha presiding and all other Officers present.

The death of one of our old members, Mr. Tom Donnelly, was reported and Chicago branch Officers and members extend their deepest sympathy to the family of Mr. Donnelly.

The guest speaker of the evening was Mr. R. F. Burns of "The New Jersey Zinc Co.," who made a very interesting and instructive talk on "The Cronak Process" and cleared up many of the valuable points regarding this process as a protection for zinc.

There were 59 in attendance at the meeting which adjourned at 10:30 P.M.

J. W. HANLON, *Secretary*

CHICAGO BRANCH

No. 1. How can turnplate metal be copper or zinc plated so that it will not blister off when baked?

Answer. In this case it was thought that it was overcleaned in to strong a cleaner, use a mild cleaner to correct the trouble.

No. 2. Do all the black finishes depend on oil or lacquer for protection?

Answer. Yes, most all the black finishes are followed by oil or lacquer for protection.

J. W. HANLON, *Secretary*

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THE ABSTRACT SECTION

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Electrodeposition of Tin from Solutions of its Compounds. By M. A. KLOCHKO and Z. S. MEDVEDEVA. *J. Applied Chem.* (U.S.S.R.) **15,** 120-7 (1942); *Chem. Abstracts* **37,** 2273 (1943). Tin was plated from solutions of $SnCl_4$. When the solution is made alkaline, 90% cathode efficiency was obtained with insoluble anodes, 77 g./l. tin, and a c.d. of 28 amp./sq. ft. At 47 amp./sq. ft., the efficiency was 50%. InHCl solutions, insoluble anodes did not give good results, but with iron anodes good results were obtained with 130 g./l. tin, HCl up to 140 g./l., and c.d. up to 28 amp./sq. ft.

ERNEST H. LYONS, JR.

Tin Coatings on Copper Wires. Determination of thickness by an Electrolytic Method. By P. W. SEDDON. *Metal Ind.* (London) **62,** 37-8 (1943). The wire is connected as anode in an electrolyte of 25 g. $SnCl_2$, 100 ml. concd. HCl, and water to make 500 cc. The c.d. is about 9 amp./sq. ft. The time from the start of current flow to a sudden drop in the amperes flowing is a measure of the thickness of the coating. A second drop occurs when the tin-copper alloy next the wire is dissolved.

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Silver Plating on Zinc and Zinc Alloys. By M. ENGEL and K. LIEB. *Mitt. Forsch-Inst. Edelmetalle Staatl. hoheren Fachschule schwäbisch Gmünd* **6,** 14-22 (1941); *Chem Zentr.* **1942, I,** 1554. To obtain a silver coating on zinc without blisters (which in part are due to surface defects in the basis metal), the following method was used with good results. The zinc surface was well polished and degreased first with trichlorethylene and then with lime; or electrolytically treated for a short time with 3-5% HCl, and coated with an intermediate layer of Cu or brass 6-8 u., (.0002-.0003″) thick (with or without previous Ni deposition) in order to prevent diffusion of Ag into the zinc.

M. HARTENHEIM, *Chemical Abstracts*

Experiences with Alkaline Zinc Plating. By J. S. JONES and P. M. WALKER. *J. Electrodepositors' Tech. Soc.* **17,** 155-63 (1942). Electrodeposited bright zinc was found to be as good as Cd in many applications, and is less subject than Cd to fingermarking and to blackening during storage. In changing from Cd to bright zinc, tanks formerly used for Cd should be thoroughly cleaned before use for zinc. Detailed directions are given for operation, control and maintenance of a proprietary bright cyanide zinc solution. Procedures for successful bright zinc barrel plating are described.

VERNON A. LAMB, *Chemical Abstracts*

Protection of Duralumin for Aircraft Construction. *Attilio Iacoboni. Atti Guidonia* **1941,** 53-112; *Chem. Zentr* **1942, I,** 1049. Various corrosive conditions (salt spray, immersion methods, drying bath) are used to give comparative tests of the effectiveness of various protective methods for Duralumin (Al plating, anodic oxidation, lacquering). The most effective protection for all corrosive conditions is

obtained by plating with Al; with less severe conditions, the other methods can be used to advantage, e.g., anodic oxidation for fuel tanks and various internal parts, and in many cases lacquering upon anodic oxidized base.

H. STOERTZ, *Chemical Abstracts*

Cathodic pickling in Presence of Inhibitors. By W. MACHU and O. UNGERSBOCK. *Arch. Eisentuttenw.*, **15,** 301-6 (1942). Advantages are cited of pickling of steel by a combination process: chem. pickling with H_2SO_4 or HCl combined with cathodic pickling. Very thorough tests have shown that in presence of very small quantities or organic inhibitors with simultaneous cathode treatment of the steel at very low c.d., the solution of metal can be almost completely prevented. The necessary amount of inhibitor is only 0.1 – 0.05 of the concn. required for chem. pickling without current, while the c.ds. are only 0.01 – 0.001 of those required for cathodic pickling without inhibitors. The combined method produces a more uniform, brighter and smoother surface without deeply etched grooves in the surface, and only very little H is absorbed by the steel; this is easily given off again by allowing the steel to remain in the hot wash water for a short time. The pickling effect can easily be controlled by regulation of the c.d.

M. HARTENHEIM, *Chemical Abstracts*

A Method for Determining the Thickness of Electrodeposited Films. (A Preliminary Report.) By S. I. D'YACHKOVSKII. *Sci. Records Gorky State Univ. No.* **7,** 113-18 (1939); *Khim. Referat. Zhur.* **1940** No. 9, 117-18. Zinc-coated metal is placed in N H_2SO_4 and the quantity of zinc dissolved is determined by the increase in conductivity of the solution, measured by a Wheatstone bridge calibrated by determining the conductivity of standard mixtures of H_2SO_4 solutions and sulfates. The thickness of Ni and Cr films cannot be determined by this method, owing to the passivity of Ni and Cr. The thickness of films on objects which cannot be immersed in a vessel for determination of the electrical conductivity is determined in a special tube with sealed-in Pt electrodes. The tube is filled with the electrolyte and the open end of the tube is brought into contact with the object to be examined. The electrolyte does not flow out of the tube because its diam. is only 0.5 mm.

W. R. HENN, *Chemical Abstracts*

The Cathodic Production of Metallic Powders. By M. PASSER. *Kolloid-Z.* **97,** 272-80 (1941). A survey of the conditions which lead to the formation of spongy cathodic ppts. New experiments on zinc powders from zincate solutions show that gases of any kind streaming past the cathode exert a compacting action of a purely mech. nature. Stirring in the neighborhood of the cathode or moving the cathode gave ppts. of similar types. Much finer granules were obtained by the addition of the Pb ion to the electrolyte. The size of the crystallites is much smaller than that of zinc dust from the retort process according to x-ray photographs. In principle any metal can be obtained in a powder form by a continuous electrolytic large-scale process if agitation, which may result from the addition of solutions and the removal of product, in the neighborhood of the electrode is avoided.

H. BUCHER, H. C. THOMAS, *Chemical Abstracts*

Electrolytic Brightening of Zinc, Cadmium and Silver in Cyanide Solutions. E. RAUB and B. WULLHORST. *Mitt. Forsch-Inst. Edelmetalle Staatl. höheren Fachschule schwäb. Gmünd* **6,** 1-14 (1941); *Chem. Zentr.* **1942, 1,** 1553-4. Zinc was brightened anodically in a 5% KCN solution with 1-5 v. cell voltage; the voltage decreases with increasing KCN content. If the bath is stirred the voltage range for brightening is higher. Above 40° (104° F.) no brightening take place; more than 5% $K_2Zn(CN)_4$ and more than 4% KOH impair brightening. The conditions for brightening Cd and Ag are similar to those for zinc. The reflectivity of anodically polished metals exceeds that of mechanically polished sheets. Anodically brightened zinc and Ag show a film on the surface.

M. HARTENHEIM, *Chemical Abstracts*

BOOK DEPARTMENT

BOOK REVIEWS

By

DR. GEORGE DUBPERNELL, *United Chromium, Inc.*

Industrial Uses of Chromium Plating—A Bibliography and Correlated Abstract of the Published Literature. M. Kolodney. 71 pages, mimeographed. Information Release No. 4, War Metallurgy Committee of the National Academy of Sciences—National Research Council, 2101 Constitution Avenue, Washington 25, D. C., July, 1943. Gratis.

Dr. Kolodney and the War Metallurgy Committee have performed a very useful service in culling from the literature the experiences of users of industrial chromium plate, and making them readily available in this well organized report. The first part is an introduction of 11 pages which reviews the history and principles of chromium plating, and the physical properties of electrolytic chromium. An extensive table is included which gives the various Rockwell C. Hardness values for the steel basis metal for various uses, as recommended by different authors.

A second section of 22 pages reviews different specific applications of industrial or hard chromium plate. This is more than an abstract as the results obtained in each use are given, and the results of different workers correlated. The table of the corrosion resistance of electrodeposited chromium is very extensive, and references are given on the resistance to about 165 different corrosive media. The third section of the report comprises about 13 pages and deals with the effect of chromium plating on the

properties of the basis metal. The embrittlement of plated articles and the effect of the deposit on the fatigue strength are reviewed; also the measures which may be taken to minimize or eliminate these effects.

The fourth part of the report consists of about a page of conclusions and recommendations. The more extensive employment of industrial chromium plate in proved applications is recommended, and specific suggestions are made for further testing and investigation in connection with some other uses. The last part of the report is a chronological bibliography of 326 references comprising 18 pages and giving the full title of each reference.

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SAN FRANCISCO	34	+ 5	+14
SPRINGFIELD	70	+ 7½	+10.7
GRAND RAPIDS	87	+ 9	+10.3
CLEVELAND	104	+ 8½	+ 8.1
NEWARK	174	+12	+ 6.3
PITTSBURGH	55	+ 3	+ 5.4
BALT.-WASHINGTON	98	+ 4	+ 4
NEW YORK	138	+ 4	+ 2.8
TOLEDO	37	+ 1	+ 2.7
WATERBURY	107	+ 2½	+ 2.3
TORONTO	95	+ 2	+ 2.1
PROV.-ATTLEBORO	40	+ 1	+ 2
CHICAGO	278	+ 4½	+ 1.7
NEW HAVEN	103	+ 1½	+ 1.4
BRIDGEPORT	78	+ 1	+ 1.2
DETROIT	282	+ 3½	+ 1.2
PHILADELPHIA	132	+ 1	+ .7
MILWAUKEE	94	+ ½	+ .53
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ROCHESTER	86	− 5	− 5.8
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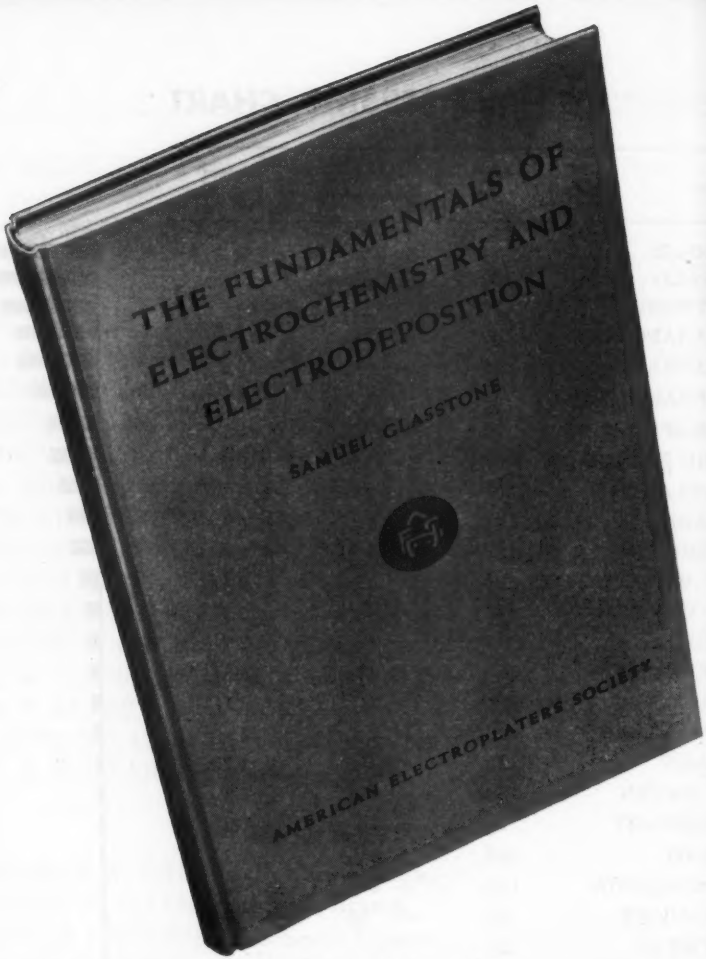

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Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BURNISHING BALLS

Abbott Ball Co., The, Hartford, Conn.
Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Hanson-Van Winkle-Munning Co., Mata-
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

BURNISHING COMPOUNDS

Baker Co., M. E., Cambridge, Mass.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnusson Products Corp., Brooklyn, N. Y.
Oakite Products, Inc., New York, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Frederic B., Inc., Detroit, Mich.
Sturgis Products Co., Sturgis, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Wyandotte Chemicals Corp., Wyandotte, Mich.

BURRING COMPOUNDS

Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., The, Detroit, Mich.
Burns Mfg. Corp., E. Reed, Brooklyn, N. Y.
Divine Brothers Company, Utica, N. Y.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Inc., Haverhill, Mass.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

BURRING MACHINES

Acme Mfg. Co., Detroit, Mich.
Baker Co., M. E., Cambridge, Mass.
Divine Brothers Co., Utica, N. Y.

CADMIUM SERVICE

Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Kocour Co., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
McGean Chemical Co., Cleveland, Ohio
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BUYERS' GUIDE

CEMENT—POLISHING WHEEL

Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., Detroit, Mich.
Divine Brothers Company, Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Inc., Haverhill, Mass.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

CHROMIUM SERVICE

Harshaw Chemical Co., The, Cleveland, Ohio
Kocour Co., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

CLEANERS—METAL—ALKALI

Baker Co., M. E., Cambridge, Mass.
Blakeslee & Co., G. S., Chicago, Ill.
Detroit Rex Products Co., Detroit, Mich.
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Kocour Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Mitchell-Bradford Chemical Co., Bridgeport, Conn.
Oakite Products, Inc., New York, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Phillips Mfg. Co., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Sulphur Products Co., Greensburg, Pa.
Udylite Corp., The, Detroit, Mich.
Wyandotte Chemicals Corp., Wyandotte, Mich.

CLEANERS—METAL—EMULSION

Baker Co., M. E., Cambridge, Mass.
Detroit Rex Products Co., Detroit, Mich.
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Oakite Products, Inc., New York, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Phillips Mfg. Co., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Wyandotte Chemicals Corp., Wyandotte, Mich.

CLEANERS—METAL—SOLVENT

A.B.C. Chemical Co., Waterbury, Conn.
Baker Co., M. E., Cambridge, Mass.
Detroit Rex Products Co., Detroit, Mich.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Maas & Waldstein Co., Newark, N. J.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Mechanical Process Co., South Orange, N. J.
Mitchell-Bradford Chemical Co., Bridgeport, Conn.
Oakite Products, Inc., New York, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Phillips Mfg. Co., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.
Wyandotte Chemicals Corp., Wyandotte, Mich.
Zapon Division, Atlas Powder Co., Stamford, Conn.

BUYERS' GUIDE

DEBURRING MACHINES

Divine Brothers Co., Utica, N. Y.
Lea Mfg. Co., The, Waterbury, Conn.
Sturgis Products Co., The, Sturgis, Mich.

DEGREASING EQUIPMENT—SOLVENT

A.B.C. Chemical Co., Waterbury, Conn.
Baker Co., M. E., Cambridge, Mass.
Blakeslee & Co., G. S., Chicago, Ill.
Detroit Rex Products Co., Detroit, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Mechanical Process Co., South Orange, N. J.
Phillips Mfg. Co., Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

DRYERS

Blakeslee & Co., G. S., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Magnus Chemical Co., Inc., Garwood, N. J.
Meaker Co., The, Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

DRYERS—CENTRIFUGAL

Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

EQUIPMENT, PLATING—AUTOMATIC AND SEMI-AUTOMATIC

Baker Co., M. E., Cambridge, Mass.
Ceilcote Co., The, Cleveland, Ohio
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Heil Engineering Co., Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

FILTERS

Alsop Engineering Corp., Milldale, Conn.
Baker Co., M. E., Cambridge, Mass.
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Industrial Filter & Pump Mfg. Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

GENERATORS

Baker Co., M. E., Cambridge, Mass.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BUYERS' GUIDE

GLUE–POLISHING WHEEL

Advance Polishing Wheels, Inc., Chicago, Ill.
Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., The, Detroit, Mich.
Burns Mfg. Corp., E. Reed, Brooklyn, N. Y.
Divine Brothers Company, Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

GRINDERS–BELT

Divine Brothers Co., Utica, N. Y.
Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Lasalco, Inc., St. Louis, Mo.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

GRINDING MACHINES SPECIAL

Acme Mfg. Co., Detroit, Mich.
Divine Brothers Co., Utica, N. Y.

GRINDERS PORTABLE

Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

LACQUER

Egyptian Lacquer Mfg. Co., The, New York, N. Y.
Maas & Waldstein Co., Newark, N. J.
Michigan Chrome & Chemical Co., Detroit, Mich.
United Chromium, Inc., New York, N. Y.
Udylite Corp., The, Detroit, Mich.
Zapon Division, Atlas Powder Co., Stamford, Conn.

LACQUER–SPRAY EQUIPMENT

Baker Co., M. E., Cambridge, Mass.
Ceilcote Co., The, Cleveland, Ohio
Paasche Airbrush Co., Chicago, Ill.

LATHES–POLISHING AND BUFFERS

Acme Mfg. Co., Detroit, Mich.
Baker Co., M. E., Cambridge, Mass.
Divine Brothers Company, Utica, N. Y.
Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

METAL WORKING LUBRICANTS

Magnus Chemical Co., Inc., Garwood, N. J.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

PLATING CHEMICALS

McGean Chemical Co., Cleveland, Ohio
Merck & Co., Rahway, N. J.

POLISHING MACHINES–AUTOMATIC

Acme Mfg. Co., Detroit, Mich.
Divine Brothers Co., Utica, N. Y.

RACK COATINGS

A.B.C. Chemical Co., Waterbury, Conn.
Baker Co., M. E., Cambridge, Mass.
Ceilcote Co., The, Cleveland, Ohio
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Maas & Waldstein Co., Newark, N. J.
MacDermid, Inc., Waterbury, Conn.
Michigan Chrome & Chemical Co., Detroit, Mich.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.
United Chromium, Inc., New York, N. Y.
U. S. Stoneware Co., The, Akron, Ohio
Zapon Division, Atlas Powder Co., Stamford, Conn.

BUYERS' GUIDE

RECTIFIERS

Baker Company, M. E., Cambridge, Mass.
Enthone Co., New Haven, Conn.
General Electric Co., Bridgeport, Conn.
W. Green Electric Co., Inc., New York, N. Y.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

RHEOSTATS

Baker Company, M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

RUST PROOFING SYSTEMS

Detroit Rex Products Co., Detroit, Mich.

SOAP

Abbott Ball Company, The, Hartford, Conn.
Baker Company, M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

SOLUTION CONTROL METHODS

Hanson-Van Winkle-Munning Co., Matawan, N. J.
Kocour Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

SOLUTIONS—NICKEL—TIN—LEAD, ETC.

Zialite Corporation, Worcester, Mass.

SOLVENT—RECOVERY SERVICE

A. B. C. Chemical Co., Waterbury, Conn.
Baker Company, M. E., Cambridge, Mass.
Mechanical Process Co., South Orange, N. J.
Phillips Mfg. Co., Chicago, Ill.

STRIPPING SOLUTIONS—LACQUERS

Detroit Rex Products Co., Detroit, Mich.
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Maas & Waldstein Co., Newark, N. J.
Magnuson Products Corp., Brooklyn N. Y.
Michigan Chrome & Chemical Co., Detroit, Mich.
Oakite Products, Inc., New York, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Puritan Mfg. Co., The, Waterbury, Conn.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Wyandotte Chemicals Corp., Wyandotte, Mich.

STRIPPING SOLUTIONS—METALS

Baker Company, M. E., Cambridge, Mass.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Puritan Mfg. Co., The, Waterbury, Conn.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Sulphur Products Co., Greensburg, Pa.
United Chromium, Inc., New York, N. Y.

BUYERS' GUIDE

TANKS—CERAMIC

Baker Company, M. E., Cambridge, Mass.
Ceilcote Company, The, Cleveland, Ohio.
Enthone Co., New Haven, Conn.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Heil Engineering Co., Cleveland, Ohio.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Storts Welding Co., Meriden, Conn.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.
U. S. Stoneware Co., The, Akron, Ohio.

TANKS—GLASS LINED

Alsop Engineering Corp., Milldale, Conn.

TANKS—STEEL, LINED

Baker Company, M. E., Cambridge, Mass.
Ceilcote Company, The, Cleveland, Ohio.
Enthone Co., New Haven, Conn.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Heil Engineering Co., Cleveland, Ohio.
Industrial Filter & Pump Mfg. Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Mitchell-Bradford Chemical Co., Bridgeport, Conn.
Storts Welding Co., Meriden, Conn.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.
U. S. Stoneware Co., The, Akron, Ohio.

TANKS—WOOD

Baker Company, M. E., Cambridge, Mass.
Ceilcote Company, The, Cleveland, Ohio.
Enthone Co., New Haven, Conn.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Heil Engineering Co., Cleveland, Ohio.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Storts Welding Co., Meriden, Conn.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

TEMPERATURE CONTROLS

Plating Processes Corp., Holyoke, Mass.
Sarco Company, Inc., New York, N. Y.

TESTING INSTRUMENTS

Baker Company, M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Industrial Filter & Pump Mfg. Co., Chicago, Ill.
Kocour Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

USED EQUIPMENT

Baker Company, M. E., Cambridge, Mass.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

WASHERS—METAL PARTS

Blakeslee & Co., G. S., Chicago, Ill.
Detroit Rex Products Co., Detroit, Mich.
Lasalco, Inc., St. Louis, Mo.
Magnus Chemical Co., Inc., Garwood, N. J.
Meaker Co., The, Chicago, Ill.
Phillips Mfg. Co., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

WHEELS—POLISHING

Advance Polishing Wheels, Inc., Chicago, Ill.
Baker Company, M. E., Cambridge, Mass.
Buckingham Products Co., The, Detroit, Mich.
Burns Mfg. Corp., E. Reed, Brooklyn, N. Y.
Divine Brothers Company, Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Kocour Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

BRANCH DIRECTORY

ANDERSON meets second Tuesday of every month at 7:30 p.m., at the Y. M. C. A. Anderson, Indiana. Secretary-Treasurer, E. L. McKinney, 2014 Fairview St., Anderson, Ind.

BALTIMORE-WASHINGTON meets at the Telford Cafeteria, 14th and Decatur Sts., N.W. Washington, D. C., the first Saturday of each month. Secretary-Treasurer, Abner Brenner, 6509 Fulton St., Chevy Chase, Md.

BOSTON meets at the Hotel Statler, Boston, Mass., first Thursday each month. Secretary, A. W. Garrett, 77 Neponset Ave., Dorchester, Mass.

BRIDGEPORT meets first Friday of each month at Chamber of Commerce Rooms, Stratfield Hotel, Secretary-Treasurer, Joseph G. Sterling, 134 Colony St., Bridgeport 8, Conn.

BUFFALO meets second Friday of each month at Hotel Statler; Buffalo, N. Y. Secretary J. C. Mays, c/o Carborundum Co., Niagara Falls, N. Y.

CHICAGO meets second Friday of each month at 8 p.m., Atlantic Hotel, 316 S. Clark St. Secretary, J. W. Hanlon, 3004 N. Whipple St., Chicago 18, Ill.

CINCINNATI meets on Fourth Thursday of each month at 8 p.m., at Hotel Gibson, Cincinnati, Ohio. Secretary, Alcide E. Foreman, Rt. 9, Van Zandt Road, Box 313, Cincinnati 24, Ohio.

CLEVELAND meets first Saturday of each month at Cleveland Hotel. Secretary-Treasurer, G. B. Svenson, c/o Platers Supply Co., 2059 Hamilton Ave., Cleveland 14, Ohio.

DAYTON meets second Friday of each month at the Engineers Club, Dayton, Ohio. Secretary-Treasurer, W. M. Durnbaugh, R. R. 4 Xenia, Ohio.

DETROIT meets the first Friday of each month at the Hotel Statler. Secretary-Treasurer, F. L. Clifton, 16536 Inverness, Detroit 21, Mich.

GRAND RAPIDS meets second Friday of each month, 7:30 p.m., at the Browning Hotel. Secretary-Treasurer, C. E. Abel, 11 Scribner Ave., N.W., Grand Rapids 4, Mich.

HARTFORD meets third Monday of each month alternately at Hartford Electric Light Company, Hartford and at the Elks Club, corner South and Main Sts., Bristol, Conn. Special meetings are held at the New Britain Trade School, New Britain, Conn. Secretary-Treasurer, Savin Zavarella, 84 Darlin St., East Hartford 8, Conn.

INDIANAPOLIS meets at the Hotel Riley, the first Wednesday of each month. Secretary-Treasurer, Donald L. Patrick, 3145 North Illinois St., Indianapolis 8, Ind.

LANCASTER meets second Friday of each month at 8 p.m., at Thaddeus Stevens Industrial School, Lancaster, Pa. Secretary-Treasurer, W. H. Fordney, 603 Marietta Ave., Lancaster, Pa.

LOS ANGELES meets the second Monday of each month, 6:30 p.m. at the Rosslyn Hotel, corner Fifth and Main Sts. Secretary-Treasurer, C. C. McLaren, 2236 Charnwood Avenue, Los Angeles, Calif.

MILWAUKEE meets first Friday of each month at Republican Hotel, Secretary-Treasurer, James Durnford, 2370 N. 32nd St., Milwaukee 10, Wis.

MONTREAL meets first Monday of each month at Mount Royal Hotel, Montreal, Quebec, Canada. Secretary-Treasurer, W. G. Finlay, 5670 16th Ave., Rosemount, Montreal.

NEWARK meets first and third Friday of each month at Hotel Robert Treat, Newark, N. J., at 8 p.m. Secretary-Treasurer, George Wagner, 1130 So. Long Ave., Hillside, N. J.

NEW HAVEN meets the first Tuesday of each month at Sterling Chemistry Laboratory, Yale University. Secretary-Treasurer, B. J. Gaffney, 40 Filbert St., Spring Glen, Hamden 14, Conn.

NEW YORK meets second and fourth Fridays of each month, in the Hotel Pennsylvania, 7th Ave. and 33rd St., New York City, N. Y. Secretary-Treasurer, Franklyn MacStoker, 25 Princeton St., Garden City, L. I., N. Y.

PHILADELPHIA meets fourth Friday of each month, in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, Paul Mentzer, 7324 Tabor Ave., Philadelphia 11, Pa.

PITTSBURGH meets first Thursday of each month, at 8 p.m. at the Bureau of Mines Building, 4800 Forbes St., Pittsburgh, Pa. Secretary-Treasurer, Frank Keller, 1102 Hiland Ave., Coraopolis, Pa.

PROVIDENCE-ATTLEBORO meets the third Monday of each month at the Narragansett Hotel. Secretary-Treasurer, Chas. C. Chace, 11 Friendly Road, Cranston 10, Rhode Island.

ROCHESTER meets third Friday of each month at the Hotel Seneca. Secretary-Treasurer, Donald C. Blum, 672 Mt. Read Blvd., Rochester 6, N. Y.

SAN FRANCISCO meets the last Thursday of each month, usually at Angelo's, 4307 San Pablo Avenue, Oakland, Calif., Secretary-Treasurer, Arthur Kistler, 15th and Vermont Sts., San Francisco, Calif.

SPRINGFIELD meets the fourth Monday of each month at the Hotel Charles. Secretary-Treasurer, D. S. Hartshorn, Jr., 76 Edendale St., Springfield 4, Mass.

ST. LOUIS meets first Friday of each month at Central Y. M. C. A., 16th and Locust Sts., Secretary-Treasurer, C. T. McGinley, 8238 Monroe St., St Louis, County 14, Mo.

SYRACUSE meets second Friday of each month at Bowne Hall, Syracuse University, Syracuse, N. Y. Secretary, George Simmons, 309 Park Ave., Herkimer, N. Y.

TOLEDO meets first Thursday of each month, in Room 201, of the Hilcrest Hotel, Toledo, Ohio. Secretary, Gaston Bergeman, 718 Howland St., Fremont, Ohio.

TORONTO meets second Friday of each month at Royal York Hotel. Secretary-Treasurer, E. B. Creighton, 468 Deloraine Ave., Toronto, Ont., Canada.

WATERBURY meets second Friday of the month at Elton Hotel. Secretary-Treasurer, Spencer L. Henn, Apothecaries Hall Co., Waterbury 88, Conn.

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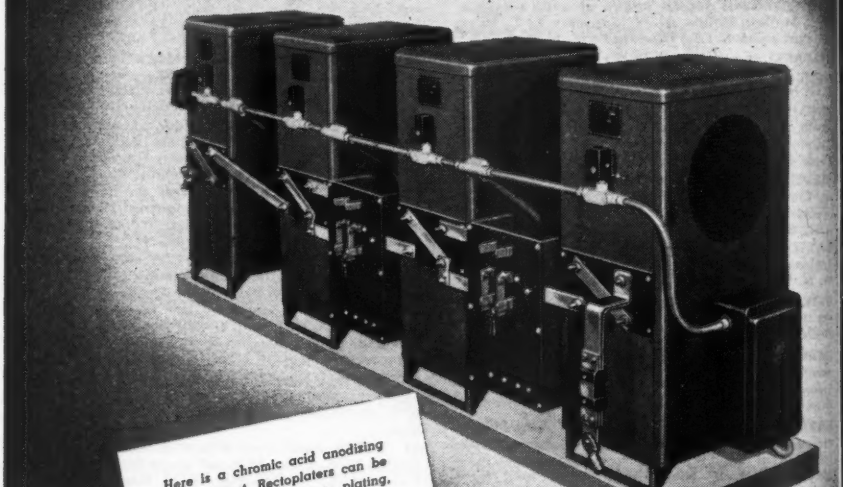

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Gumm Chemical Co., Fred'k., Kearny, N. J. . . . . Second Cover

Hammond Machinery Builders, Kalamazoo, Mich. 853
Hanson-Van Winkle-Munning Co., Matawan, N. J. . . . . Fourth Cover
Harrison & Co., Haverhill, Mass. 858
Harshaw Chemical Co., The, Cleveland, Ohio 815
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Heil Engineering Co., Cleveland, Ohio 844
Holden Company, A. T., The, New Haven, Conn. 843

Industrial Filter & Pump Co., Chicago, Ill. 831
International Conveyor & Washer Corp., Detroit, Mich. 835

Kocour Co., Chicago, Ill. 803

LaSalco, Inc., St. Louis, Mo. 799
Lea Mfg. Co., Waterbury, Conn. 826-827
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McGean Chemical Co., Cleveland, Ohio 835
MacDermid, Inc., Waterbury, Conn. . . . . Third Cover
Magnus Chemical Co., Garwood, N. J. 822
Magnuson Products Corporation, Brooklyn, N. Y. 846
Mechanical Process, South Orange, N. J. 851
Meaker Company, The, Chicago, Ill. 801
Merck & Co., Rahway, N. J. 845
Michigan Chrome & Chemical Co., Detroit, Mich. 819
Mitchell-Bradford Chemical Co., Bridgeport, Conn. 849

Oakite Products, Inc., New York, N. Y. 779

Paramount Rubber Co., Detroit, Mich. 846
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. 823
Phillips Mfg. Co., Chicago, Ill. 813
Puritan Mfg Co., The, Waterbury, Conn. 850

Roberts Rouge Co., Stratford, Conn. 850

Sarco Company, Inc., New York, N. Y. 807
Seeley Company, L. E., Bridgeport, Conn. 851
Seymour Manufacturing Co., Seymour, Conn. 809
Stevens, Frederic B., Detroit, Mich. 780
Storts Welding Co., Meriden, Conn. 847
Sturgis Products Co., Sturgis, Mich. 777
Sulphur Products Co., Inc., Greensburg, Pa. 849
Stutz, George A., Mfg., Co., Chicago, Ill. 858

Udylite Corporation, Detroit, Mich. 874
United Chromium, Inc., New York, N. Y. 793
U. S. Stoneware, Akron, Ohio 784

Westvaco Chlorine Products Corp., New York, N. Y. 778
Wyandotte Chemicals Corp., J. B. Ford Div., Wyandotte, Mich. . . . 789
Wyandotte Paint Products Co., Rackote Div., Wyandotte, Mich. . 821

Zapon Division, Atlas Powder Co., Stamford, Conn. 787
Zialite Corporation, Worcester, Mass. 852

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799
327
345
335
ver
322
346
351
301
345
319
349
379
346
323
313
350
350
307
351
309
330
347
377
349
358
74
73
4
8
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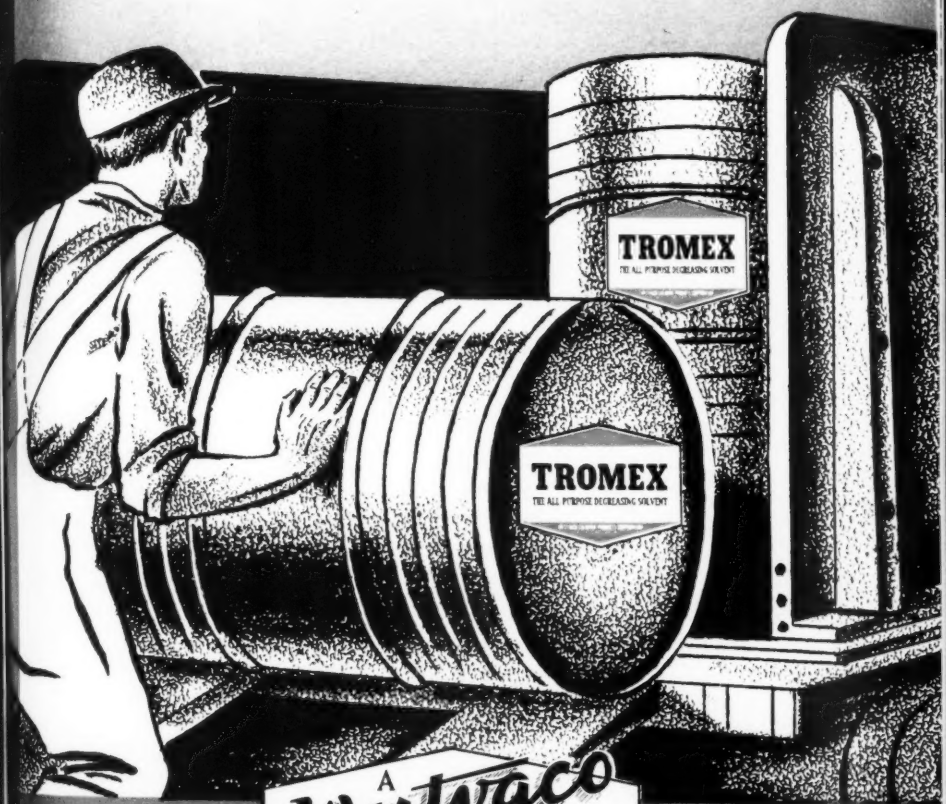

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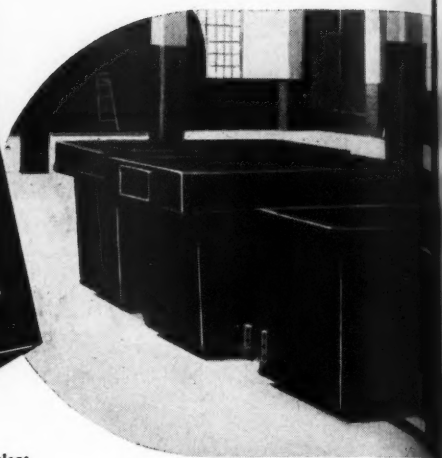

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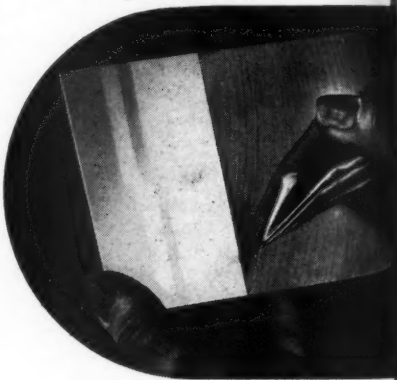

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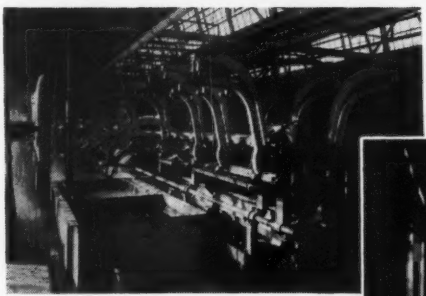

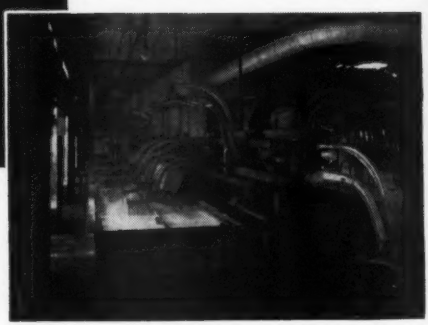

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